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ANNALS
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I.

PERFORATION OF THE SEPTUM NARIUM, FROM A STUDY OF TWENTY-FIVE CASES WITH REGARD TO ETIOLOGY AND PATHOLOGIC SIGNIFICANCE.

By Charles W. Richardson, M. D.,

Washington, D. C.

On account of the fact that the rhinologist rarely has this condition under his observation until the process has terminated into a finished or nearly finished product, we have accepted the above designation rather than the one so frequently used by others, namely, perforating ulcer of the septum. Indeed, the perforation of the septum while in the state of ulceration, or even afterward, is a condition producing so little annoyance to the patient that it is rarely called to the attention of the general practitioner and often only discovered by the specialist during routine examination. Occasionally a patient with a perforation will consult a surgeon on account of symptoms directly referable to the perforation, such as bleeding; to obtain relief from the whistling sound heard in breathing; or on account of the perforation having been accidentally detected. Perforations are usually single, rarely multiple.

Jurascz mentions two cases with double perforations, P. H. Gerber mentions a double perforation, and Natier has observed multiple perforations. They are usually round or oval in shape when involving the cartilaginous septum; when in the bone and cartilage, or alone in the bone, they are irregular in outline with their long axis in the antero-posterior direction.

The appearance of the perforation varies according to the stage in which the process is discovered. It may be in the stage of extension with the whole circumference of the perforation in an active stage of ulceration or the finished product with thin, glistening, thoroughly cicatrized edges. The amount of incrustation depends not only upon the absence or presence of ulceration, but also upon the condition of the mucosa of the affected nasal chamber. Thus we may find the edges laden with or completely free from crust.

It would be almost useless to go into a consideration of the frequency of perforation, as I find so great a discrepancy between the percentage given by various observers as to make an average of these almost worthless. Sufficient is it to say that perforations of the septum are not of infrequent occurrence. Weichselbaum, Hajek and Zuckerkandl's experiences upon the cadaver would indicate that many are never detected during life. I cannot agree with V. Lange in the statement which he makes that many are overlooked during examination in the living.

These deformities are observed at all periods of life. I have observed them as early as the fourteenth year and as late as the seventieth year of life. It would be of more interest, and of infinitely more practical value, if we could learn at what period of life the primary lesion most frequently manifests itself, which leads onward to the destructive changes noted.

Perforation of the septum can be from a pathologic and etiologic point of view divided into two groups, viz., 1st: Those with a known etiologic factor and a definite pathologic history; 2nd: Those without a known etiologic factor and an indefinite pathologic history. Under the primary grouping are included those perforations due to trauma, syphilis, lupus, tuberculosis, etc., conditions arising from organic diseases. Under the second grouping are those not uncommon forms of perforations of the cartilaginous septum, not due to any organic disease and presenting no histologic evidence of constitutional vice, always limited to the cartilaginous septum, slowly destructive, and which terminate by spontaneous healing, the so-called simple or idiopathic perforating ulcer of the septum. It is to this type of ulceration that I will in this paper more particularly direct your attention.

In my private practice I have observed forty-one cases of perforation of the septum, but it is only in the last five years that I have more than noted the fact of the mere existence of the perforation. Since 1895 I have carefully investigated the clinical histories of all cases of this character coming under my care, twenty-five in all, and the deductions drawn from these cases is the basis of this thesis.

The development of the perforation in organic diseases producing destruction of the septum is the characteristic local lesion of the peculiar disease which acts as the provocative agent. In the lupus ulceration, which is exceedingly rare, the process has never been observed in the earliest stages, but it is no doubt due to the breaking down of the nodes and the formation of ulcers with resulting necrosis and perforation of the cartilage.

In the tubercular destruction is the process more clearly to define. Zuckerkandl states that tubercular ulcerations of the nasal mucous membrane are usually rare. According to Gerber, the percentage in his clinic to all nasal affection is 0.28 per cent. The process begins with the formation of the tubercular tumor or the tubercular ulcer, both of which have a special tendency to develop on the cartilaginous septum. These lesions of tuberculosis heal or undergo extension with resulting destruction by ulceration of the cartilaginous septum. Schaffer saw eight cases of tuberculous tumors on the cartilaginous septum, four of which ended in perforation of the septum. Seifert in his report of thirty cases of tubercular ulceration of the nose, found ulceration ten times exclusively limited to the septum, of which two had produced perforation.

In all of these cases we not only find the histologic elements of a tubercular lesion but also frequently the presence of the tubercle bacillus.

The syphilitic lesions of the nasal chambers are in the form of mucous patch, superficial ulcers and gummatous infiltration. The mucous patch is by all acknowledged to be an exceedingly uncommon nasal affection in syphilis, as is also the superficial ulcer. The superficial ulcer, when it appears, is no doubt due to a gummy deposit. We are therefore forced to the conclusion that the gummatous tumor is the factor in syphilis that alone produces the extensive involvement and destruction which leads to perforation of the septum in this disease.

The development of the perforation in the second class which has no pathologic evidence as due to organic disease, under which heading comes that large class of perforations apparently due to no assignable cause and among which we must group those which apparently take place in typhoid, typhus or other fevers, is no doubt in the form of an ulceration, however produced. Of this type of perforation I have had three cases under my observation almost from the initial stage.

In the first case, that of a young woman, anemic, badly nourished and with a strong tubercular family history, I was consulted on account of discomfort in the left nasal cavity, sneezing, and occasional hemorrhages. On examination I found in the left cavity over the posterior portion of the cartilaginous septum a well marked ulcer about half a centimeter in diameter. The whole ulcer had a crater-like form. The circumference of the ulcer was opaque, and raised above the surface, evidently due to the inflammatory piling up of translucent and partially desquamated epithelial cells. The submucosa, each apparently destroyed to a less extent than the epithelial layers, added to this inverted, cone-like appearance of the ulcer. The cartilage was denuded but not perforated. This case was under my observation for several months before eventual destruction through the cartilage ensued with resulting perforation through the mucous of the opposite side.

In the second case, also of a young woman, well nourished and with a non-tubercular history, I was consulted on account of a whistling sound in breathing. In the upper surface of the cartilage I found a small pinhole-like perforation. The line of demarkation between the healthy mucosa and ulceration could not be made out. The healthy mucosa seemed to extend, macroscopically, directly to the edges of the perforation. The inner edge of the circumference of the perforation presented the characteristic evidences of ulceration. This perforation gradually extended, seemingly, by a process of molecular disintegration, without hemorrhage or crust formation about the ulcer, until now it is a healed perforation of about a centimeter in diameter.

The third case was observed in a man who consulted me on account of hay fever. In my first examination I found a small round ulcer, about two milimeters in diameter, extending down to the cartilage, the latter showing a characteristic yellowish ulcerated appearance. The ulceration through the mucosa seemed as if it were punched out down to the cartilage of the septum. Within three days perforation had resulted and a rapid molecular destruction ensued, so that in the course of three weeks nearly the whole of the cartilaginous septum was destroyed. The ulceration throughout its whole course presented the characteristics of ulceration described in the second case.

The etiologic factors have already in an indirect manner been mentioned in the consideration of the manner of the development of the ulcers. We will now discuss seriatim and more definitely the etiologic factors of perforations.

There is no doubt that congenital defects may exist in the septum, by which means there is a communication through the continuity of the septum of one nasal chamber with its fellow. This form of perforation has been described by Hyrtl, and he mentions three such cases as observed by him. Hildebrandt describes a perforation in his own case as probably being congenital. These perforations may have been congenital, and they are vouched for by two eminent anatomists, but they certainly lack the evidences of proof. Rupp quotes an authentic case reported from Beeley, by Germus, in which parts of the vomer were missing with a resulting communication. As other anatomists describes the possibility of such a condition existing, and as there is no plausible reason why such a state should not exist, we must accept this as an etologic influence.

Traumatic. Under this classification we must include the larger number of perforations through the cartilaginous and bony septum that have been made through surgical intervention during efforts to remove spurs and correct deviations. Ofttimes such perforations are unavoidable and are not due to the want of surgical skill and dexterity, but unfortunately such is not always the case. This form of perforation, after cicatrization, does not usually give rise to inconvenience unless there is a great destruction of the septum. Direct traumatism may be responsible for the perforation and such cases are mentioned by Rupp and Bosworth; certain acids, mercurials and cements.

Pressure and Inflammatory Activity. It is readily conceivable that hard growths which grow relentlessly, forcing asunder bony structure, would produce a perforation of the septum, but I doubt very much the possibility of soft tumors being capable of producing such a result, although vouched for by no less an authority than Jurascz. I am rather inclined to believe that the perforation in Jurascz's cases existed before the development of the mucous growth. It is singular to note how infrequent are perforations of the septum as a result of hematoma and abscess of the septum. Fischenich, Thorner, Ricci and Zaufal have observed perforations as the result of these conditions. I have had eight cases of abscess of the septum under my observation, and while they were all attended with considerable destruction of the cartilaginous septum and resulting external deformity, they all healed without perforation.

Rosenthal states that lupus, when it attacks the mucous membrane of the nose, affects by preference that over the cartilaginous septum. He further states that the ulceration of the nodes frequently results in perforation with great destruction of the septum. Victor Lange states that he had seen directly under his observation an advanced case of lupus that ended with perforation. He gives two other cases of perforation due to lupus. Chiari also describes a perforation so produced. There is no doubt that this is a very rare form of perforation, as rhinologic literature contains very few instances of this type.

Tuberculosis of the nasal mucous membrane is an exceedingly rare condition, if one accepts the dictum of authorities and his personal experience. I have never seen a case of tubercular involvement of the nose in my private practice. Rosenthal states that in comparison to syphilis it is an exceedingly rare disease. Zuckerkandl states that tubercular ulcerations of the nasal mucous membrane are exceedingly rare. Lange, Hajek, Schaffer (4 cases), Morrell Mackenzie (2 cases) and others have described perforations of the septum due to tubercular ulcerations.

Syphilis plays an important role as a causative agent in the production of perforation of the septum. This disease is the most frequent known constitutional condition giving rise to this form of destruction. Gummatous infiltration seems to have a particular proneness to development in the structure of the septum in syphilis involving the nasal cavity. These deposits are found most frequently in the mucous membrane over the osseous portion of the septum and at the junction of the cartilage and bone. I cannot subscribe to the statement made by Jurascz and others that the cartilaginous septum alone is often involved in this form of destruction. I do not believe that syphilitic destruction would be self-limiting, as such is not its history when involving other tissues. I am rather inclined to the views expressed by Moritz Schmidt, that one should not class a perforation of the septum as syphilitic unless the bone participates in the destructive process. Indeed, I would consider it very hazardous to advance the opinion that a healed perforation solely involving the cartilaginous septum was syphilitic in its origin, unless there were undoubted constitutional evidences of syphilis previous to the development of the ulceration. And, conversely, in all perforations of the septum solely within the osseous septum, involving cartilage and bone, in which trauma, tuberculosis and lupus could be excluded, I would without hesitation regard them as syphilitic in origin even without positive evidences of constitutional taint. I wish also to call attention to the fact that where the cartilaginous septum alone seems involved, we may have simultaneous involvement of the osseous septum which may be overlooked, although if searched for could be detected.

I can possibly illustrate better what I mean in the foregoing sentence by describing one of two similar cases of this type that have been under my observation. In this case a female patient had a large perforation through the cartilaginous septum that had healed around two-thirds of its circumference. At the floor the perforation manifested still an ulcerating surface which bled frequently, and was attended with the formation of offensive crusts. There was constant and annoying pain in the upper incisor teeth. The teeth had been examined by several dentists and found to be normal in every respect. On careful examination with a probe, I found a small sequestrum forming a portion of the palatine plate of the maxillae at their junction with the cartilage. Removal of this sequestrum and the administration of the appropriate constitutional treatment rapidly brought about cicatrization. Such a sequestrum might be thrown off without being detected and the edges cicatrizing, the perforation would be accepted as a syphilitic perforation of the cartilage without involvement of bone.

As with most forms of perforation, the syphilitic are unfortunately not brought to our observation until the greater amount of destruction has taken place, and the sequestrum has more or less completely exfoliated with resulting deformity of the septum. The question of the syphilitic origin of a perforation is one that should be approached with great caution, unless there is destruction of the bony septum or positive constitutional manifestations of syphilis elsewhere. The percentage of syphilitic to all causes is very great, although different authors vary considerably in the proportion; Jurascz gives 62 per cent., Schaffer 70, Victor Lange 50, Campbell 80, Thrasher 20, while my own is 30.

The etiology of that large class of perforations which one meets as involving solely the cartilaginous septum, which are not due to any of the conditions above mentioned, is one which is shrouded in considerable doubt. On account of the fact that this form of ulceration has never been under observation in a connected chain from the initial pathologic changes until the perforation has been completed, various theories have been offered to explain the local changes which may have preceded the ulceration of the mucosa, which is usually the first alteration in the integrity of the structure observed. The three cases of perforation, which I have above described, came under my care about as early in their history as in the case of such changes in the mucosa under the care of any other observer; yet all three of these cases showed no local change in their immediate contiguity that could in any way explain their origin. The septa in all of these cases were as nearly straight as they are found in the majority of noses. There was no history of hemorrhage in two cases: and in the one in which it was present it had only existed, in all probability, since the ulceration in the mucosa had taken place. They were all refined people who disclaimed the habit of picking in the nose, were not annoyed by difficult breathing, and were not employed in occupations which exposed them to irritating vapors and dusts.

The theory that perforations are the result of the destructive activity of local irritation and injury to the septum produced by boring with the finger nail against the septum is one that can hardly be considered as tenable; nor should it be deemed worthy of serious consideration if the integrity of the mucous membrane is normal at the time of the application of the violence. There is no doubt that an average amount of scratching and boring may be applied to a perfectly normal mucous membrane without producing any permanent destructive change. After the initial local changes have taken place, then one can well see that this process may play a most important role as a contributor to the destruction. Zuckerkandl, Bresgen, Bosworth, V. Lange, and many others mention this as a local cause.

Bosworth gives as a local cause the presence of a deflected septum, the dust laden atmosphere and other impurities producing an erosion. It seems to me that this is a cry of utter despair in searching for an assignable cause. That deflected septa are very frequently perforated no one will deny, but that the active changes producing the destruction is an erosion caused by dust laden atmosphere, which is Nature's effort to surmount the obstruction, is thoroughly illogical and in no sense tenable. The local change is the same in the deflected as in the straight septum. Most of the theories that have been advanced, claim the lesion to be primarily due to a local vascular change in the area affected. Voltolini was the first to advance along this line and he described the process as being due to a hemorrhagic ulcer. The hemorrhages taking place in the mucosa, cause local impairment of the enervation and result in the production of an ulcer. Zuckerkandl also ascribes the process to a hemorrhagic change in the mucosa which he designated by the term xanthosis. He states that in a form of rhinitis extensive hemorrhage takes place in the structure of the mucosa, the mucosa acquiring later, when the process has run its course, during which the escaped blood has undergone a typical metamorphosis, a yellowish, yellow-green, or rusty brown, conspicuous coloring. This change he designates xanthose. He claims this xanthose to be an essential predisposing cause of perforating ulcer of the septum. For the development of the atrophy of the septum, as well as for the ulcer, he describes the following stages:

1. Injury, prolonged mechanical irritation (perhaps scratching) of the mucous membrane of the septum.
2. Hemorrhage in the mucous membrane. Xanthosis.
3. Destruction of the capillary and thereby defective nourishment.
4. Partial atrophy, or perforating ulcer, after infection has or has not taken place.

Hajek accepts the hemorrhagic theory plus infection as the cause of the changes produced in the septum. He states that in the pseudo-membrane, not seldom, there is found a golden-green pigment that may be very diffuse. This circumstance proves that before the necrosis of the mucous membrane a hemorrhage had taken place therein. There is no doubt that pigment may be found distributed in the mucous membrane of the septum, as a result of hemorrhage into its substance, without convincing us that such discovery of pigment is positive proof of coagulation necrosis. Hajek ascribes the development of the ulcer and the destructive changes in the septum to the activity of the staphylococcus pyogenus aureus and the streptococcus pyogenes.

Dietrich's theory is that of localized thrombosis, while Rosenfeld advances the belief that the change is due to a tropho-neurosis.

An interesting theory is advanced by J. R. Straw as of etiologic moment in the production of perforation. He resides in Ashland, Wisconsin, where the temperature during winter often falls as low as 30 degrees below zero. He states that the inhabitants of this region are subject to frequent freezing of the nose and throat. As a result of the frequent freezing and necessary thawing out there is produced an erosion of the mucous membrane.

It is interesting to observe that all the theories advanced, except Rosenfeld's, have in common a localized change taking place in the arterial supply to a limited area of the septum. This localized change is ascribed as due to irritation produced in some instances by the drying of mucus over the area affected and to the change produced by the frequent boring into the nasal cavity. We frequently observe this change described, that is, the local condition which locally predisposes to the development of the ulcer over and over again in cases which heal or are never followed by perforation. I cannot but accept that the underlying cause of this destructive change is a destruction of the innervation of the cartilaginous septum whereby the resisting power of the structure is so impaired that an ulceration with molecular destruction of the cartilage takes place. Victor Lange mentions this view also and states that we have to do with a pronounced disturbance of the nutrition and cites the ulcus ventriculi and the perforating ulcer of the foot as analogous.

How is this disturbance of the innervation produced? There is no doubt that many diseases can occur in the necessary nutritive change that may be provocative of the disintegration of the septal mucosa attended upon the formation of a septal perforation. When perforation results during typhoid, typhus, and rheumatic fever and in diphtheria, it is in all probability not due to any pathologic influence that these diseases exert localiy upon the septum, but is rather due to the impaired innervation of the septum that occurs as a result of the lowered vital activity in the height of these disturbances.

In active or latent tuberculosis the nutritive activity of various tissues may be more or less impaired, these changes being most active in the mucous membranes. Hajek states that in his thirty-three cases of perforation observed on the cadaver, thirty-one showed some evidence of tuberculosis either in the cured or active stage.*

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*Of the 2,136 bodies examined 990 died of tuberculosis—46.3 per cent. of all cases.

Weichselbaum's cases were all observed in tubercular subjects. It is interesting also to observe that only two or three of Weichselbaum's cases were true tubercular perforations—all of Hajek's and the remainder of Weichselbaum's were histologically non-tubercular simple perforations of the septum. Hajek was so impressed with this observation that he remarks as to the singular frequency of evidence of acute or chronic tuberculosis, or of healed tuberculosis in some form, in perforating ulcer of the septum.

Again Hajek states almost in his closing sentence: "One would feel tempted to accept the lessened resistance of the mucous membrane of the tuberculosed as the opportune moment for the origin of the ulcerous formation, through which we would have found the before mentioned individual disposition for the pathogenesis—did not the observation of the living show that as a rule we were not dealing with tuberculous individuals. The spontaneous healing of the ulcer also speaks against such an assumption."

It is really surprising to find Hajek after such an able exposition of the subject, make such a final deduction. From a finding in five living subjects, which on the face of the histories given he made no attempt to investigate with regard to their tubercular history, he overthrows the enormous preponderance of findings as discovered in the dissecting room. On the cadaver he finds in his perforated cases healed tuberculosis, which may have been present in all of his five living cases, but beyond the power of physical detection. He distinctly states that in all of his cases in the cadaver the ulcerations were of the simple variety, although occurring in tubercular subjects; yet in his concluding sentence he states that the spontaneous healing speaks against them being disposed to by the tubercular condition. If the tubercular condition did not militate against their healing before death as demonstrated in the cadaver, why should it in the living? The condition is not a tubercular ulcer, but a process which is probably predisposed to by a tubercular diathesis, and Hajek seemed to be strongly impressed and almost ready to accept it.

In a thorough study of seventeen non-tubercular, non-specific perforations which have come under my observation, I find that eleven of the subjects either have tuberculosis, or a strong family tubercular history. This occurrence gave occasion to thought and the question arose as to the possible predisposing etiologic relationship between simple perforation of the septum and latent or present tuberculosis. After investigating and noting the frequency of septal perforation in those who had past or present evidences of tubercular lesion, I was forced to conclude that there must be a predisposing relationship. We cannot lightly throw aside the evidences given by numerous observers as to the local changes which lead up to the development of the ulcer; that is, the local vascular changes such as hemorrhage into the mucosa, xanthosis, thrombosis, and coagulative necrosis, all of which indicate a local impaired nutritive change in the mucosa, because such changes are frequently observed in cases which do not produce ulceration or terminate in perforation. Nor can the bacillary theory of Hajek be as ruthlessly laid aside. Hajek had clearly proved that these micro-organisms, the staphlycoccus pyogenes, and streptococcus pyogenes, are found in the tissue about the margin of the ulcer. Whether these micro-organisms are merely an incidental deposit during the life history of the destructive change, as they are more or less constantly present in the nasal chambers, or the actively producing local agent, it is quite difficult to decide.

Independent of the local changes present, it seems that there must be some constitutional determining cause which in a certain series of cases lessens the normal nutritive activity of the affected tissue, so that a molecular disintegration, or ulceration, takes place, such ulceration extending until the normal nutritive changes are sufficiently strong to resist the onward encroaching ulceration. It seems quite consistent to suppose that during the severity of a typhoid, typhus or acute exanthem, such a lowering of the nutritive activity takes place in the septum, as well as in other tissue, so that local changes already present might lead onward to further destructive changes. Such a lowering of nutritive activity can readily be ascribed to the tubercular and tubercularly inclined.

I shall herewith give an outline of the eleven cases with a tubercular or latent tubercular history.

1. A youth 20 years of age. Large perforation. One sister died of tuberculosis. Brother with deformity resulting from caries of spine. Ulceration supposed to have occurred during typhoid fever.

2. A man, aged 50, had tuberculosis as a youth. Relieved by life spent in the west. Large perforation, perfectly cicatrized.

8. A man, aged 40. Large perforation. His mother died of tuberculosis. Anemic mucous surfaces. Left recurrent paralysis, signs of inactive consolidation at left apex.

4. Youth, aged 14. Atrophic rhinitis. Large perforation. Parents died of tuberculosis.

5. Youth, aged 16. Large perforation. One sister died of tuberculosis. Another sister with incipient tuberculosis. Perforation supposed to have occurred during typhoid fever.

6. A man aged 40. Large perforation. Has had several hemorrhages from lungs. Anemic mucous surface. Consolidation over right apex. Now in Asheville. Child operated for adenoids.

7. A woman, aged 70. Extensive cartilaginous destruction. Father, mother and two brothers died of tuberculosis. In youth said to have tuberculosis. Only son has tuberculosis.

8. A man, aged 34. Large perforation. Sister died of tuberculosis. Has extensive involvement of right lung.

9. A man aged 44. A perfectly round perforation. Mother died of tuberculosis. Anemia of mucous surfaces.

10. A man, aged 36. Small perforation. Father died from a "protracted pneumonia." This patient was seen in 1897. He died early this spring as his brother states from a general wasting, a slight cough, and ulceration of the rectum—tuberculosis.

11. A young woman. Case one described in development of ulcer. Parents died of tuberculosis.

The six cases of simple perforation in which there was no clinical history of tuberculosis are as follows:

12. Young woman. Case described in development as number two. Perfect family history.

13. Young woman, aged 30. Small well-cicatrized perforation. Ascribed the ulceration to typhoid fever.

14. A young woman, aged 24. Oval perforation with cicatrized borders. Atrophic rhinitis.

15. A young woman, aged 35 (?). Large perforation, well-developed, well-nourished woman. Atrophic rhinitis.

16. A married woman, aged 46. Large perforation. Perfectly straight septum. This perforation is said to have been produced traumatically during the introduction of a feeding tube through the nose while an inmate of an institution. The patient was being treated for hysterical mania. A maternal aunt died of tuberculosis. This is too remote to be classed with above cases.

17. A man, aged 65. A large perforation with cicatrized edges. Perforation said to have been noted immediately after recovery from typhoid fever.

The remaining 8 cases which make up the set of twenty-five, which have formed the basis for this study, are all of the syphilitic variety. They all had clear syphilitic histories, as well as the characteristic local evidences of syphilitic perforation, in that they involved not only the cartilaginous but also the osseous septum. In two of these cases as now observed, with perfectly cicatrized borders involving apparently only the cartilaginous septum, one would be constrained to believe them simple perforations; yet in both of these cases, at an earlier stage, when they first came under my observation, there was osseous necrosis in the floor of the nose, and from each there were small sequestra removed before the healing process was assured, and both on careful investigation gave characteristic constitutional evidences of infection. The five remaining cases present nothing of interest except that they evidenced the extensive destruction that usually attends syphilitic involvement of the septum.

An analysis of the twenty-five cases above mentioned, shows eight to have been due to a local change through the degenerative metamorphosis of a characteristic lesion of a known constitutional disease. In a proportionate ratio of 30 per cent. of the seventeen remaining cases, without clearly defined etiologic agency, we have eleven in which there was a positive indication of tuberculosis or the tubercular diathesis, and six without this evidence, showing a proportionate ratio of about 68 per cent. of these as having a history with tuberculosis more or less in evidence. The remaining six of this latter class gave as etiologic factors atrophic rhinitis in two cases, typhoid fever in two, and negative in two.

This large preponderance of perforation of the cartilaginous septum in persons affected with tuberculosis or with strong tubercular histories, is as Hajek states, in commenting on the extreme frequency of the finding of so many perforations on the cadaver in tuberculous individuals, more than a simple coincidence. To me it seems as though the process is one that is predisposed by impaired nutritive action in the mucous membrane covering the cartilaginous septum as well as in the cartilage itself, such nutritive change being induced by diseases which impair the general nutritive activity by their ataxic type, as typhus, typhoid, and kindred diseases, or by tuberculosis and the tubercular diathesis. Tuberculosis and the tubercular diathesis, as is well known, impress upon various tissues and organs of the body such alteration in their nutritive processes that when the proper stimulus is applied, they lead to degenerative changes which may or may not show the characteristic histologic elements of tuberculosis.

We all frequently observe during our routine work the various changes which have been described by Voltolini, Zuckerkandl, Weigert and Hajek as affecting the mucous membrane of the septum, many of which endure for years without change, many heal, and a few ulcerate with destructive perforation of the septum. That the greater percentage of cases show no lethal activity in the mucous membrane or cartilage of the septum is, I think, due to the fact that the nutritive activity in the cartilage and mucosa is normal; when this is abnormally lowered, due largely to the predisposing conditions above mentioned, we have the lethal changes resulting.

II.

A CASE OF ISOLATED, UNILATERAL, LATENT EMPYEMA OF THE SPHENOIDAL SINUS WITH DELIRIUM AND MENTAL SYMPTOMS. OPERATION. RECOVERY.

By Jonathan Wright, M. D.,

BROOKLYN.

I have been thus explicit in the title of this paper as I desire to give prominence to those features in the report of a case which render it instructive, an attribute which can not usually be predicted of rare cases. The symptoms of disease in one sinus are, usually, except in the case of the maxillary sinus, and often also there, masked by concomitant disease of other sinuses or of the nasal chambers. This has done much to prevent the possibility of a differential diagnosis in the localization of sinus disease, a matter of the very greatest importance to the rhinologist. The aid offered by this case in the elucidation of these points would alone justify the report of the case, but, as will be seen, there are other points of interest presented by it which will excuse intrusion of its report here.

Sphenoidal sinus disease is half as frequent as that of the antrum of Highmore. It usually exists without especial symptoms. If the os is patent the cavity drains well, and the symptoms of post-nasal catarrh may or may not attract the attention of the patient. In either event the sinus condition is almost invariably overlooked by the physician, experienced though he may be in the diseases of the nose and throat. This applies more especially to chronic catarrhal conditions. Acute inflammation of the sphenoidal sinus is frequently present with a like condition in the other sinuses. These are common enough we know in the coryza associated with influenza, and with pus in the nose the general diagnosis of sinusitis is not difficult, while its specific localization is often very difficult. The majority of the acute cases recover without especial treatment, beyond that directed toward the amelioration of the symptoms of a cold in the head. An involvement of the sphenoidal sinus in the chronic suppuration of one or more of the other sinuses is not infrequent. An isolated suppuration is less common, and when the purulent accumulation does not find vent into the nasal fossa, it is needless to say its presence is usually overlooked and only discovered, if at all, at autopsy, death having resulted from that cause, or more commonly from some other affection. I need not here go into a reference to the literature of the subject of which, as well as my own experience, the foregoing is a summary.

Dr. X., aet. 57, married and doing a large nose and throat practice, came to my office for the first time on Nov. 30, 1901. His speech was low and his manner dazed. He said he was desperate. The pain in his head was unendurable. In speaking he would raise his left hand to the vertex of the head toward the occiput and bring it down to his left eye and below, which gesture, often repeated, localized the pain better than he could describe it. As well as could be ascertained at the time, the patient's previous history was not so significant, nor could, on more favorable opportunity, any evidence of disease of any kind be elicited, prior to an attack of the grip in the middle of January, 1901. This was accompanied by a severe coryza and a pain of the same character from which he was now suffering. After a few weeks of ordinary treatment the symptoms all subsided.

In July he had an attack of the same very severe pain. This he attributed, in the absence of any nasal symptoms, to the influence of the heat and his exposure to the sun. It lasted for some weeks. He was then somewhat forgetful, irritable and emotional. In August, during a trip to Nova Scotia, he was entirely free of all symptoms. In September he was again seized with pain of the same character. It gradually became atrocious, unendurable and of a heavy, bursting, boring character, not sharply localized in his description of it, but his hand continually making the excursion over the left side of his head I have described. There was great hyperesthesia of the scalp. He stated that he was frequently seized with severe attacks of sneezing after which he had some relief, but I could get no history of any nasal discharge.*

These attacks of sneezing would sometimes be followed by a short period of relief. He said that others had noted a foul smell on his breath. This I have subsequently learned was first noticed in September. It was now markedly present. It was not the smell of dead bone or of ozena, but with the diagnosis partly formed, I surmised it to be of the character of retained decomposing secretions.

At times during the early morning hours he was fairly comfortable, but after 11 o'clock the pain became severe again, subsiding somewhat at night. There was considerable daily variation in the severity of the pain, but on the whole it became worse from week to week until I saw him. Dr. Joel W. Hyde, under whose care he had been, urged him to seek a rhinologist, and he had consulted a very distinguished confrere, who he said had assured him he had no nasal trouble, but advised him to go away again for his health. Dr. William Browning had seen him several times, and had examined him carefully, and believed, as he afterwards told me, there was no intra-cranial trouble. Singular to say, the patient had gained ten pounds in weight since February. This was the history elicited in a somewhat confused shape at my first interview, and has been subsequently straightened out a little.

On examination, the nasal mucosa, except for some congestion, was healthy and clean, and there was no especial obstruction to be seen either anteriorly or posteriorly. The introduction of a cotton-tipped probe caused severe pain, not especially localized, in either nostril. No other evidence was elicited by the probe. The middle turbinated bones, while apparently normal, left a very narrow slit in the nose, through which inspection of the ethmoidal or sphenoidal region was very unsatisfactory. Posteriorily a good view of the region was obtained in the rhinoscopic mirror, but nothing especially significant could be noted. Transillumination of the frontal and maxillary sinus gave bright spots over these regions. The patient's temperature was subnormal and his pulse was slow. I could discover no other evidence than that here detailed of intracranial mischief, but I was strongly impressed with the possibility of its existence. I was, however, more convinced that the patient had pus under pressure in the left sphenoidal sinus, and perhaps in the posterior ethmoidal cells. This I advanced to the patient as a tentative diagnosis. I advised him to use adrenalin spray followed by a hot nasal douche directed toward the suspected spot, to keep a morning noon and night record of his temperature, and to return to me in four days.

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*I questioned him closely as to this but could elicit nothing, but since his recovery I have learned from him that sometimes during these attacks of sneezing he would blow or spit out what he supposed was a semisolid mucosity, of moderate size.

On the morning of that day I received a note from his wife telling me he was unable to come. He had been confined to his bed for twenty-four hours and had been delirious. In consultation with Dr. Hyde, Dr. Browning and Dr. A. T. Bristow, I saw him at noon. He was then somewhat stupid, having had bromids, and his mind wandering in slight delirium occasionally, but he was capable of answering questions rationally. The pain was intense, and the adrenalin spray and the hot douches had only intensified it without bringing any discharge of pus. His mental condition had prevented him from keeping a record of temperature. Since I had seen him he had treated patients, but some of his prescriptions had been returned from the druggist as improper. Just before we saw him he had spat up a foul-smelling, cheesy mass from his nasopharynx. I immediately examined his nose and nasopharynx again, but I could discover no sign of pus following the extrusion of the mass, nor indeed any other abnormality. From the fact that no pus had followed the semisolid mass I was inclined to think the trouble in the sinus might be a malignant growth. On careful examination it seemed to most of the gentlemen who examined him there was some proptosis of the left eye, but this was a matter of doubt. Dr. L. A. W. Alleman examined the fundus with the ophthalmoscope. With the exception of some slight congestion in the left eye the picture was normal, as was the vision.* Dr. J. M. Van Cott examined his blood and found the leucocytes normal in amount. An examination of the urine showed a normal specific gravity and an absence of albumin. As the patient's condition showed no improvement it was decided to make an effort to explore the sinus. The next morning (Dec. 5) he was transferred to the King's County Hospital. His condition precluded the idea of operation under cocain and illumination of the parts, while if necessary to open the posterior ethmoidal cells an external incision would be necessary. In the afternoon he was etherized.

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*An ophthalmoscopic examination of the patient after recovery throws some light on the question of meningeal or cerebral involvement. I, therefore, append a letter from Dr. Allen recently received, which, it seems to me, argues the existence at the time of

I had the choice of intra-nasal operation or a supraorbital incision by which to make the attempt to perforate through a healthy frontal sinus and the anterior ethmoidal cells, with a doubtful prospect of striking pus in the posterior ethmoidal cells, and the probability of being unable to establish proper drainage into the nasal chambers from the sphenoidal cavity. Moreover, the subsequent syringing of the cavity would be difficult without the removal of the middle turbinated bodies and a perforation in a line with the anterior nares. On the other hand a perforation through the nose, while attended with some uncertainty as to the sphenoidal sinus, was too risky a performance on

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operation of some sort of intra-cranial lesion, which subsided after the evacuation of the sinus. The character of the lesion I am not prepared to determine.

Dear Doctor:—On my first examination of Dr. X., made the day before you operated, I experienced some difficulty owing to his mental condition, and the bad lighting. In my examination of the fundus I could, however, satisfy myself that no gross lesion was present, but that the whole retinal picture was hazy, and disc margin blurred, and a low grade neuro-retinitis probably present. Pupillary reaction was normal and motility unaffected.

From an examination made on Jan. 16, '02, I am convinced that he was at that time suffering from a neuro-retinitis, which evidently increased subsequent to the first examination. The nerve in the right eye is covered with a faint haze, and on the nasal side of the disc there is pronounced blurring and the retinal vessels rise sharply and bend over this indistinct area. The left eye also suggests a previous inflammation and the nerve is decidedly blanched on the temporal side.

An examination of Feb. 4, '02, shows an improvement of the retinal picture, and field carefully taken on the perimeter shows no limitation. The bilateral affection of nerve suggests to me a central origin. Very truly yours,

Dictated L. A. W. Alleman.

the posterior ethmoidal cells without the guidance of vision. Nevertheless this was the route which I decided upon, as I was sure the trouble had its seat in the sphenoid wherever else it might be, and there might be time for a subsequent supraorbital incision, if necessary. With the valued assistance and advice of Dr. Bristow and Dr. Arrowsmith, and the house staff of the hospital, the palate was drawn forcibly forward by a tape through the nose. The tip ends of the middle turbinated bones could be felt through the naso-pharynx. The finger of an assistant was kept as high in this situation as possible, the gouge end of Bryan's ethmoidal curette was introduced through the left nostril between the middle turbinate and the septum, until it rested on the assistant's finger in the choana and impinged on a solid wall. The end was then raised a little above the finger and a boring motion was imparted to the instrument. Quickly soft bone was felt through the mucosa. Very little force was necessary to perforate this and the instrument entered a cavity. Pus was seen then to be present far back in the anterior nares. The instrument, after as large an opening was made as I dared to attempt, was withdrawn and in the groove of the gouge for 1/2–3/4 inches was seen the cheesy, dark, foul-smelling secretion, similar to what he had spat out the day before. The odor, however, was masked by the ether and the carbolized solutions. As it was not at all certain that the other sphenoidal sinus was healthy, it also was opened in a similar manner, without difficulty, but no pus followed, nor was there any evidence of thick secretion in the groove of the instrument. The distance from the alae of the nose to the firm posterior wall of the sinus was 3 1/2 inches. This corresponding to the distance which I had determined by repeated measurements in the cadaver.* I was certain that the instrument was in the spenoidal cavity. In that direction any distance exceeding three inches is sure to lead into the sphenoidal sinus, if a cavity is entered.

An attempt was now made to remove the middle turbinate bones. The usual anterior incision with scissors proved impossible on account of the lack of room and the absence of illumination. A snare failed to engage the bone. A septal spokeshave, invented by Chappell for the removal of cartilaginous spurs, with a quadrilateral perforation long enough to engage the whole of the middle turbinate, was introduced into the nostril, and adapted as well as possible by the assistant's finger in the nasopharynx over the turbinate. It was then forcibly removed from the nose, bringing with it all the soft parts and a portion of the bone. The sinus was again sounded and found easily accessible. The middle turbinate of the other side was also removed. The nasal cavities prior to the operation had been thoroughly sprayed with adrenalin, and all these procedures were attended with very slight bleeding, no secondary hemorrhage resulting.

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* Twentieth Century Practice, Vol. VI.

The patient stood the operation well, but three hours subsequently he had a chill and a temperature of 104.5°F. By morning it had fallen to below 100°, and the pulse correspondingly. It was noted on the day following the operation that the slight proptosis on the left side had disappeared. No complications arose from perforation of the right sphenoidal sinus.

One or two pieces of foul smelling, cheesy matter came from the nose, but these were small, and no more appeared after three or four days. The nasal cavities were irrigated thrice daily and the sinus on the left side washed out through a female catheter once daily. The amount of pus removed was insignificant and drainage seemed perfect.

The patient was immediately relieved of all his former pain and the odor disappeared entirely from his breath. For the first three days his mental condition improved but the delirium, perhaps never entirely absent, became more marked. It was of a mild, muttering, wandering character gradually increasing until it was necessary to restrain him to keep him in bed. The temperature did not go above 100° and was frequently subnormal, the pulse of good quality, ranging below 80°. He took abundance of nourishment and his bowels were moved by cathartics. Dr. Browning, who saw him from time to time, ascribed the delirium to sepsis. As there was no somnolence nor decided evidence of cerebral involvement, nor meningeal inflammation, it was thought possible there might be a collection of pus in the posterior ethmoidal cells. The delirium increasing, the patient was again etherized on December 12th, one week after the first operation. A curved incision was made through the lower part of the left eyebrow, the skin being raised on the supraorbital ridge. It extended from the middle of the latter well down on to the glabella. An elliptical flap was turned down, the periosteum raised, the healthy frontal sinus exposed by removal of a small button of bone with a hand trephine. The posterior wall of the infundibulum was perforated, and a passage was forced with the gouge end of Bryan's curette through the anterior and posterior ethmoidal cells and into the sphenoidal cavity, the posterior wall of which seemed to be reached at a distance of about 3 1/4 inches from the glabella. No pus nor dead bone was encountered, the route of the instrument being seemingly through healthy cell tissue. Care was taken, of course, in breaking through the thin lamellae to keep the point of the instrument directed away from the cranial cavity. Beyond the front of the anterior ethmoidal cells vision was impossible. The track of the gouge was thoroughly syringed out. It was impossible to break a way from the posterior cavities into the nose without inflicting dangerous laceration on healthy structure, but a way was forced into the nasal fossa through the anterior ethmoidal cell. Through this a strip of iodoform gauze was inserted from the external incision into the nostril, bringing it out anteriorly.

I am free to confess that at this second operation, meeting with no more pus in the ethmoid, I believed that the patient had an intra-cranial lesion of some kind, and I gave his friends an unfavorable prognosis, which opinion indeed I had entertained to a considerable extent from the first, believing it probable that intra-cranial mischief had already started when I saw him.

With this Dr Browning did not agree, insisting that if there was trouble within the cranial cavity it was of a congestive character, favoring the idea, however, that delirium was due to sepsis. The patient had a chill after the second operation and a temperature of 102.5° in a few hours. This subsided, however, and never subsequently went above 100°, except on one occasion when it rose to 101 1/2°.

The delirium however continued for nearly ten days, but gradually diminishing. The drain was removed from the external incision at the end of thirty-six hours, the track was syringed out for two or three days, but by the end of a week the incision had practically healed, there being for a day or two a little inflammation of the edges which caused the rise of temperature spoken of. The stitches were removed at the end of a week and no complications ensued from the second operation. Gradually the delirium subsided. At the end of a week there was a decided change for the better in his mental condition, though somewhat forgetful and unable to pursue a train of thought persistently. At the end of ten days he was entirely rational and was removed to his home, the pulse and temperature becoming normal. His sleep and appetite, which indeed had at no time been persistently bad, were excellent.

He was then able to sit in a chair and with a good illumination the sphenoidal region was inspected. Some fragments of tissue hid the ostium but a probe passed by these readily and freely into the sphenoidal cavity, and I was assured that the irrigation through the catheter, followed out without illumination in his delirium, had been thorough and effectual. Small fragments of sanguinolent mucus, such as we are accustomed to see in the maxillary sinus, could be freely washed from the sphenoidal cavity daily. Bits of the mucosa being removed with the snare, a perforation, at the normal site of the ostium, into the sphenoidal sinus could be seen. This still shows no tendency to contract. No pus of consequence can be detected, but a good deal of the mucus from the sinus drops into the nose, which is easily kept clean by means of the anterior nasal douche.

I am still unable to say whether the delirium was due to a slight sepsis which did not markedly affect the temperature, or whether it was due to cerebral congestion; I am inclined to believe in the latter hypothesis.

January 8, 1902, at the time of this writing, a very small amount of muco-pus is washed daily from the sphenoidal ostium, which can be plainly seen. The patient appears very well, but he says that prolonged mental exertion still tires him. The improvement in his mental condition has been marked in the last week. He now walks and drives in the open air daily.

The lesions drawn from this case are obvious.

The peculiar agonizing, bursting, boring character of the pain, referred to the vertex chiefly, though radiating in other directions, in any case in which other sinuses are evidently involved, points to retained secretion within the unyielding walls of the sphenoidal cavity.

This need not be an absolutely continuous pain, because we may readily imagine an intermittency in the pressure. Such a case from anatomic relation is especially apt to develop cerebral symptoms. The result in this case is evidence that those symptoms do not necessarily indicate an uncontrollable lesion, and are not by any means, however, grave they may be, contra-indications for operation. On the contrary a basilar meningitis is not absolutely beyond the hope of amelioration from such a procedure. In any event, a case of more advanced meningeal trouble or a cerebral abscess can not be made any worse, and the operation is indicated on the chance of a mistake in the gravity of the diagnosis.

The presence of pus in the nose is not necessary to a diagnosis of sphenoidal disease. The history and especially the character of the pain and the foul odor of the breath, I think, fully warranted the diagnosis, while the expectoration of the foul cheesy mass, it seemed to me, made the diagnosis very positive. While disease of the posterior ethmoidal cells could not be excluded, especially in the presence of the proptosis, the absence of pus or polypi in the nose led me to suspect they might be unaffected. A suppuration so extensive as to involve the posterior ethmoidal cells would be much more liable to give rise to edema of the nasal mucosa and allow the trickling of pus than an abscess walled in by the thick bone of the sphenoid.

As for the operation, under the circumstances it was hazardous and uncertain, chiefly however because of the variation in the site and extent of the sphenoidal cavity. Nevertheless, I believe that the plan pursued was the proper one. The chances of perforating the body of the sphenoid are slight when the gouge enters by the anterior nares and is guided to some extent by the finger in the nose pharynx, provided no senseless violence is used. If the cavity, however, is not entered at a depth of 3 1/2 inches, further attempts in that direction had best be abandoned, or indeed before that depth is reached, if the distance to the anterior wall measures less than three inches: the external incision should then be resorted to and the whole line of cells opened up.

III

SUPERHEATED COMPRESSED AIR IN THE THERAPEUTICS OF CHRONIC CATARRHAL OTITIS MEDIA.

George W. Hopkins, M. D.,

CLEVELAND, O.

While engaged in conducting extensive experiments to determine the efficacy of superheated dry air in the treatment of obstinate joint affections, some five years ago, it occurred to the writer that this most important agency might be of some value in the treatment of those obstinate cases of chronic catarrhal otitis media which are characterized by ankylosis of the ossicles. With a view to determining the capabilities of the treatment in this direction, several typical cases were selected, the diagnosis in each instance being confirmed by colleagues of reputation as aurists, and suitable heating devices for their treatment constructed.

The first case subjected to treatment is of especial interest at this time as it illustrates, in a measure, the possibilities of treatment even with the crude heater, employed at that time, and also because it has had the best test of time, having been discharged about five years ago.

The patient, John L., aged fifty-three, a carpenter, with excellent family and personal history, has never been seriously ill, but has had nasal catarrh for fifteen years and gradually increasing deafness for ten years.

Examination revealed a typical case of hypertrophic rhinitis. The watch tick could be faintly heard with the watch in very close contact with the left ear. The tick could be heard to a distance of three inches from the right ear. The left ear was selected for the test.

Diagnosis: Chronic catarrhal otitis media, with sclerosis and displacement of the tympanum, ankylosis of the ossicles, slight dilation of the Eustachian tube, and some labyrinthine involvement.

The diagnosis was confirmed by two colleagues of reputation as aurists, before treatment was instituted. Regular, systematic treatment, continued for two years before this experiment was made, had scarcely stayed the progress of the disease.

Treatment: The ear was thoroughly cleansed with alcohol for several days before treatment was instituted. The patient was then seated in a comfortable chair, the ear examined and found perfectly clean. Narrow strips of dry gauze were packed into the ear and a large pad of dry gauze placed over the ear. The ear was then covered with the canvass-sleeve hot-air conductor, and a current of air sent into the canal at a temperature which gradually attained 400° F.

The temperature was easily borne, if gradually increased until a high point was reached; the only discomfort attending the treatment arising from a severe headache which followed it, but which was promptly relieved by a dose of codein.

Following the hot air treatment, the Eustachian tube was always inflated with a warm stimulating vapor from a globe nebulizer, vibratory massage with the nebulizer completing the treatment.

The patient was not allowed to leave the office for a half hour after treatment and the ear was tightly packed with warm cotton before he went out.

The nose and pharynx received appropriate treatment with antiseptic washes, etc.

Treatments were continued on alternate days for three months, at the end of which time he could hear the watch tick distinctly at thirty-four inches, and surprised his friends by invariably replying to their whispered references to him.

The right ear was then similarly treated, and in ten weeks an equally good result was secured.

Examination showed that the ears were normal in appearance. The patient was discharged January 6, 1897, and careful tests made at frequent intervals since have shown no tendency to recurrence.

As to the philosophy of such a cure by this agency little can be said at this time, but it seems certain that the intense heat stimulates the circulation through the blood supply on the posterior side of the manubrium, causing absorption of the articular deposits; removing atrophy and relieving the rigidity of the tensor tympani. The ossicles lie so near the surface that they receive the full benefit of heat applied to the tympanum, and adhesions between portions of the ossicular chain and the adjoining bony walls of the middle ear are readily removed.

Naturally, much better results are secured in the same period of time in hypertrophic cases than in those characterized by hyperplasia; but many cases of the latter type, which would ordinarily have been regarded as hopeless, have gradually improved under this treatment until marked benefit was secured.

Apparatus: An ordinary gas room heater was fitted up with a funnel top and a canvas sleeve which conducted the heat to the ear under treatment.

For four years following this trial the writer pursued similar experiments on a number of cases—sixty-two in all—and had but four absolute failures—all of them occurring in old people who had extensive labyrinthine involvement.

But while these results were exceedingly gratifying, there were several serious and annoying obstacles to the successful employment of the treatment which have only recently been entirely overcome.

The chief obstacle has always been the fact that it was difficult to introduce superheated air into a cavity like the ear, which would not permit the free passage of a current of hot air to its blind end—the membranum tympani—where the heat was most needed.

Before the desired temperature could be secured at the tympanum the heat would become unbearable on the auricle.

Most of the heat was, of necessity, wasted, and any hot air which reached the tympanum merely reached it accidentally, so to speak.

The natural obstacle in this direction was increased in magnitude by the necessity for packing the canal with gauze to prevent burning. Nor could these obstacles be overcome by employing a different heater from the prevailing type.

All of the heaters now manufactured, to the knowledge of the author, are of the "natural draft" type, in which most of the heat must, of necessity, be wasted, in order to secure perfect combustion, and if any attempt be made to drive the heat through any resistance, such as a closed cavity, like the ear affords, the heat will immediately

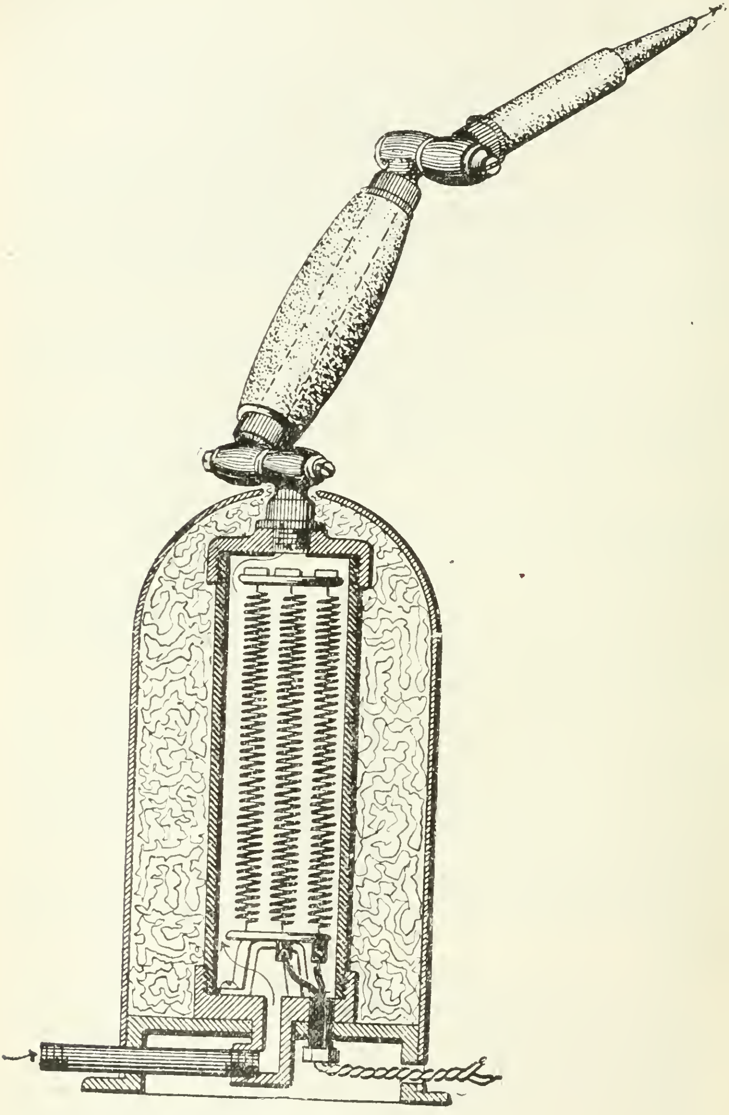

Fig. 1.

travel in a volume through paths of less resistance—the draft holes.

Consequently we are powerless to direct the heat where we would, at will.

This obstacle may be overcome, in a small way, by perforating the 'sleeve,' or conductor, freely near its distal end, but, at best, even this constitutes a very crude form of treatment.

Nevertheless, despite these readily apparent disadvantages, the old appliances and old methods have yielded such splendid results as were never attainable by other agencies.

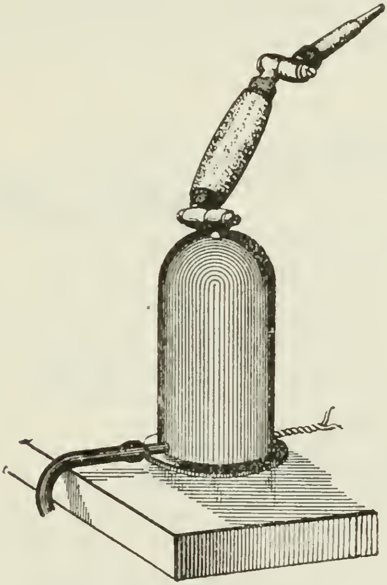

Fig. 1.

A far better way has been found, however, and it is made available by a heater recently constructed for the author, along entirely different lines, by The Ferry Heater Co., of Cincinnati.

This heater has been made for me in three types, as illustrated, deriving their heat, respectively, from alcohol, gas and electricity, the choice of instruments depending upon convenience.

The heater in its various types derives its superiority from the fact that it heats compressed air and delivers it to the patient, under pressure, at the desired point only, and it cannot escape at any other point.

The alcohol heater (fig. 1) consists of a metal cone around the inside of which is wound a tapering coil of copper tubing. Beneath it is an alcohol lamp which heats the coil to a high temperature in a few minutes.

Compressed air from a tank, pump or bulb enters the heating coil at the bottom, through rubber tubing, and leaves it at the top through a metallic tube having an ear-tip of vulcanized fiber, shaped similarly to an ear speculum.

The delivering tube has two rotating joints which make it readily adaptable to any position of the patient, and the vulcanized fiber ear-tip does not become inconveniently hot, even when the hottest air is passing through it.

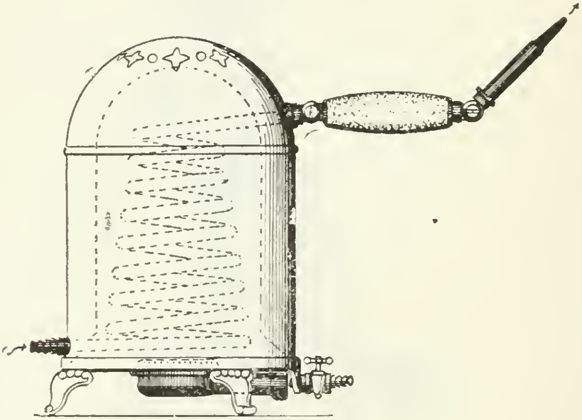

Fig. 2.

This heater is far superior to those of the old type, but has a much smaller capacity than either the gas or electric heater of the new type.

The gas heater (fig. 2) consists of a blue-flame heater over which is set a similar, but larger coil of copper tubing. The compressed air enters and leaves the coil in the same manner. It has a large capacity, is economical in cost of operation, and gives splendid results.

The electric heater (fig. 3) is the ideal appliance of this ideal type. It takes the current from the 110-volt lighting circuit through an ordinary lighting-socket and plug, and can be used on either the direct or alternating current.

It consists of an air-tight tube, holding within it the wire heating-coil. A nickel-plated hood surrounds it, and the intervening space is packed with asbestos.

The wires enter the tube at the bottom through a bushing, and as the tube is perfectly air-tight it serves the purpose of a coil of copper tubing and makes the latter unnecessary.

Compressed air enters the tube at the bottom and leaves at the top in a manner similar to the other heaters of this type. Air passing through this appliance acquires its maximum temperature in eight minutes—a rate of elevation which is just about right—and the heater is an ideal one in every respect.

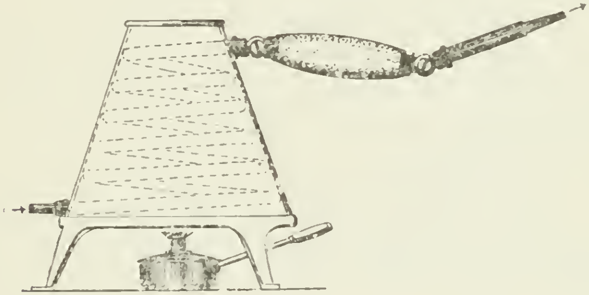

Fig. 3.

With either the gas or electric apparatus an enormous volume and degree of heat can be secured at will.

The results secured by employing a heater of this type are incomparably better than the good results secured from heaters of the old and crude type.

Heaters of the new type have a direct, definite and positive action. They embody safety and convenience in every detail and yield certain and prompt results because the compressed air which they heat must escape, with more or less force, at the exact spot desired and cannot escape at any other point.

So great is this advantage that compressed air heaters will perhaps ultimately entirely replace the old "natural draft" heaters.

Several seemingly peculiar facts must be borne in mind in employing compressed air heaters:

(1) When the appliance becomes hot and exit is through a small opening, as in an ear-tip, the temperature of the air is proportional to the rate of flow, or degree of air pressure. Strange as it may seem, the air temperature may be increased one hundred degrees by increasing the air pressure five pounds, or conversely, the temperature may be decreased by lowering the pressure. This fact enables us to regulate the temperature at will by merely increasing or decreasing the volume of air entering the cylinder.

(2) The air temperature drops very rapidly after the air leaves the exit-nozzle and in order to secure the maximum heat the part under treatment must be as near the nozzle as possible and still allow room for escape of the used air if a cavity like the ear is under treatment.

As to the results which may reasonably be expected from the judicious and skillful employment of this agency with good appliances in cases of chronic catarrhal otitis media, it may be said:

(1) That as an exclusive treatment it is rarely of much value in bad cases.

(2) That when indicated and judiciously employed, in conjunction with other measures of recognized value, it will give results which would be utterly impossible without its aid.

(3) That when employed with care it is absolutely safe unless contraindicated.

(4) That it is of little value in old subjects who have extensive labyrinthine involvement.

(5) That it stimulates absorption of articular deposits, removes atrophy and relieves rigidity of the tensor tympani.

(6) That it acts more favorably on the ossicular chain than on many other articulations, because of their exceptional proximity to the surface.

(7) That arteriosclerosis, serous effusions into the tympanum and perforations of the tympanum are usually contraindications, and always contraindications to the inexperienced operator.

Technique: The ear selected for treatment is carefully examined and found to be perfectly clean and dry. A light pad of gauze (two thicknesses) is placed over the ear and with an ear speculum the gauze is pressed deeply into the canal. The ear-tip of the heater is then carried well into the canal, leaving only room enough between the tip and the tympanum for the escape of the used air.

The electricity is then turned on, or the gas ignited (as the case may be) and the compressed air is admitted to the cylinder under about five pounds pressure. It is well to give a ten or fifteen-minute seance, increasing the temperature gradually until the limit of toleration is reached. The temperature steadily increases until the heater reaches its generating limit at that air-pressure, and if the patient tolerates the temperature well it may be further increased by raising the air pressure to seven, eight or even ten pounds, in most cases. One cannot be guided by thermometers in giving these treatments and hence they are not employed on the new heater described. The only guide which can safely be followed is the individual toleration of the patient. But it is well to remember that the more slowly the temperature is raised the higher temperature the patient can endure without discomfort.

Treatments are best given three times a week for from three to twelve months.

Every case must be treated as a whole. He who neglects the appropriate treatment of the naso-pharynx is doomed to disappointment.

Antiseptic washes must be used. All abnormal conditions must be rationally treated. Constitutional measures, when indicated, must not be neglected. Inflation of the Eustachian tube with a warm, stimulating vapor from some good apparatus like the Globe nebulizer is usually imperative.

It is well to practice Eustachian inflation and vibratory massage of the middle ear with medicated vapor from the nebulizer after each hot air treatment, being particular that the vapor is warm. A warm vapor is easily secured by connecting the compressed air heater in service with the nebulizer, sending the compressed air first through the heater and then through the nebulizer.

Careful attention to all details brings most gratifying success in the form of gradually and steadily improved hearing and gradual disappearance of tinnitus.

A single detail neglected may cause absolute failure.

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IV.

THE RECORDING OF EAR CASES.

By B. Alex. Randall, M. A., M. D.,

PHILADELPHIA.

PROFESSOR OF EAR DISEASES, UNIVERSITY OF PENNSYLVANIA AND PHILADELPHIA POLYCLINIC, ETC.

It is much to be regretted that the matter of ear-records is still in such a chaotic and unsettled condition, and that excellent as are some of the schemes presented, they still offer much cumbersome fulness or other elements of unavailability which greatly limit any extensive use. That of Rohrer is wonderfully complete in most of the details which it suggests for record, yet lacks several of those points which to me seem clearly essential; and while the graphic method of Hartmann is excellent so far as it goes, still its usefulness has narrow limitations. Case-books in prepared form have been devised by numerous authors, but their value in some cases is offset by inappropriateness to many others; and a waste of space and awkward suggestion of incompleteness results from such hard-and-fast methods. Yet for the adequate study of most of our cases, many details must be systematically worked out and recorded; and if our results are ever to be made fairly comparable a more uniform notation must be devised of a simplicity and yet completeness, that will commend it to a wide circle of otologists. Any prepared page, which undertakes to offer blanks for *all* details, is really impracticable to more than the very limited circle of users. Therefore, a ready scheme of noting on the blank page with fair system and condensed fulness those details which are essential to the case in hand seems far preferable.

Having used for a decade or more a scheme of this sort which I find corresponds closely to that of Gradenigo and others, it seems fair to offer it as one having some at least of those elements of simplicity and flexibility which may lead to its wider adoption. On the blank page of my case-book the name and age of my patient occupy the first line, with space for the major diagnosis. The second line gives the date, the residence, the occupation, and the family physician, with room for any secondary diagnosis. The third and fourth lines are given to the tests of hearing, which can be compressed simply yet clearly into thus little space. A fifth and as many sequent lines as are needful can give the history, and then two lines for right and left give the otoscopic findings. The eighth line then records the nasal and pharyngeal condition, and the details of treatment can come below. The record compressed within these lines needs usually but moderate expansion on further occasions to fill out any gaps and to keep it complete with the further history of the case.

Of the details here given, a small fraction only have been prearranged in any of the set forms and the need to have these ready-prepared as a time-saver or reminder should not be great. Much must depend upon the completeness and exactness of application of the points recorded in this limited space; and abbreviations to meet individual fancy must of course be used in order to thus compress them. Yet it is, I believe, sufficient to enter these data in the method which I employ to enable any other aurist to make readily comparable study-records, and I find it perfectly feasible to note, at any time of treatment, changes in the degree or character of the results with fair precision and facility.

The record of the third or fourth lines therefore, with the tests of hearing, is the central part of the scheme and begins with the note of hearing for the voice, faint whisper, stage whisper, conversational or loud voice, as the case may be, tested generally by the cardinal numbers up to thirty spoken with the "reserve air" remaining in the lungs after ordinary tidal expiration. Knowing that a stage-whisper should be heard some fifty feet, dependent in the individual case principally upon the room and the choice of the higher and lower pitched words, we are able to gather a vague but most practical impression as to the hearing in these directions.

Following this come the tests with the tuning-forks; and while in this I frequently employ from the lowest to the highest commonly in use, I consider four as covering the essential ground and being but little supplemented by others. The tuning fork of fifty double vibrations per second is a most real test of the early phases of obstructive deafness. Not heard by many with little but prodromal symptoms, its audibility to many perfectly deaf for high tones through nerve-lesion renders its pointings of great differential value. The fork of 25 double vibrations is really heard in its fundamental tone by few, if any ears; that of one hundred vibrations is unheard by few, unless extremely deaf, whatever the seat and character of the lesion; the fork of one thousand vibrations can be heard by many wholly unable to hear that of two thousand vibrations and lacks, therefore, much of the value as a test for percipient lesions which is furnished by the higher-toned fork. Tests higher than this are little used except in the form of the Galton whistle, because the Koenig's rods or the high forks are not generally available; but the convenient little whistle is of much value if it be of standard construction as are too few of those offered for sale. Its range should be from about 4000 to upward of 40000 double vibrations per second, as its obturator is screwed up from the tenth to the first turn marked on its scale.

In determining with the fork the measure of the hearing, the duration of the tone or the distance at which it is heard (for these two are strictly comparable) is to be noted after a blow which shall be as regular in standardization as possible. To this end nothing is better than the plan of standing a fork on end upon the thigh and letting it fall of its own weight through its own height to strike the muscle cushion above the knee. Each fork will then give a tone of fairly uniform strength dependent upon its own weight and height, and if these differ in the instruments as furnished us by the dealers we need only make record of such dimensions in order to have the basis of our comparison.

As determined from normal ears the figures found, whether for distance or for duration, constitute the denominators of fractions of which the findings in the individual cases furnish the numerators. These placed in the lines of our record for right and left ear respectively, after the number or symbol of the fork employed, give us a ready and concise record. The symbol of a given fork or tone is so indeterminate in various nomenclatures (c. standing sometimes for a fork as low as 128 double vibrations per second, or of the next octave or even the second octave above, up to 540 double vibrations per second) that the record of the vibrations made has a definiteness which surpasses the convenience of the briefer symbol. Schwabach's method of recording the result of each fork both as to air and bone-conduction means the expenditure of an undue amount of time, but we can generally accomplish all that is needful by making this comparison for those forks only which the other elements of the case prove to be more distinctive; while the more simple Rinné's test or Roosa's still simpler "louder back or front?" furnishes the same information in a practicable amount of time.

In practice the test for air-conduction may best precede that for bone-conduction; and the Rinné's test made before the Weber test will often secure from the astonished patient the acknowledgment that he hears better in the worse ear, which he may have supposed was wholly devoid of hearing and would probably not have believed had not the previous test borne in the conviction upon him. Politzer's test with the tuning-fork vibrating before the nostrils where it should be heard louder in the instant of swallowing, is a test of greatest value as determining the physiologic patulency of the Eustachian tubes, and should never be omitted. The watch and acoumeter have seemed to me of too little value to be worth the time consumed in employing them; but the data above given may be supplemented by them as well as by the Bing, Gelle or other tests where they seem of probable value. The point of greatest importance seems to me, that within 10 minutes one can make and record all those tests which seem essential to the comprehension and presentation of the case. It is because of this simplicity, efficiency and flexibility, I would commend some such method of examination and scheme of record as worthy of wider trial if not of general acceptance.

EXAMPLE.

No. 2,797, Mrs. John Smith, aged 27
12.10.01. 1810 Walnut Street. (Dr. Wm. Brown.) | O. m. c.c; incip. left.
Cerumen impaction, right.

A. D. Loud whisper 1 m. $A = 25$ d.v.s. 0cm.; $A = 50$ 1 cm.; $A = 100$ 5 cm.; $A = 200$ 10 cm.;
$c = 500$ 20 cm.; $c^1 = 1000$ 10cm.; $c^2 = 2000$ 10cm.; Galton 100 — 8; Be$>$ Ac; Pol.—; Weber right

A. S. Faint whisper .50 $A = 25\ ^{2}/_{5}$; $A = 50\ ^{5}/_{10}$; $A = 100\ ^{10}/_{15}$; $A = 200\ ^{25}/_{40}$;
$c = 500\ ^{35}/_{40}$; $c^1 = 1000\ ^{25}/_{25}$; $c^2 = 2000\ ^{20}/_{20}$; Galton 100 — 8; Be. = Ac: Pol. +

Hearing waning 2/3 years, espec. on right; hissing nearly constant; "dropping in throat."

Otosc. A.D. Cerumen plug-syringed; walls fair; Mt. dull and depressed; mobility poor; little change by catheter.

A. S. Canal free; Mt. depressed; fair mobility; improved by inflation; catheterization freer than right.

Nares narrowed anteriorly left; post-nares thickened; mucus in right tube-mouth and on granular back wall.

V.

SALIENT POINTS IN THE TREATMENT OF SYPHILITIC LESIONS OF THE NOSE AND THROAT.

By Carolus M. Cobb, M. D.,

BOSTON, MASS.

Notwithstanding the amount of study which has been given to syphilitic lesions, there is still a great diversity of opinion in regard to treatment. There is, of course, no question of the value of iodid of potash and mercury in dealing with this disease, but the question is in what form, and in how large doses, and for how long a time shall they be given. The disease runs such a protracted course and varies so much in individual cases, that it naturally leads to this difference of opinion.

A physician may enjoy a large practice for many years without seeing a severe type of the disease, and such a one is very prone to think that the disease is particularly amenable to treatment or that his method of treatment is more efficacious than the method usually employed, but if the same physician is unfortunate enough to have under his care one of those types of the disease in which one region of the body after another is involved he will be ready to accept the statement of those who claim that syphilis is never cured.

Whether it is or not we will not now discuss, but certainly the local lesions which are easily reached and can be directly treated can be cured, and I remember to have heard Jonathan Hutchinson argue in one of his lectures that he had the same right to expect cure in those lesions which could not be seen and reached, as he had in the external lesions. For the most part the rhinologist has to do with lesions which can be seen and therefore directly treated. Primary disease of the nose and throat is exceedingly rare and I remember to have seen but two cases, in an experience covering a period of eighteen years. One of these was a chancre of the lower lip from kissing and the other a chancre of the tongue, the method in which it was acquired not stated.

The rhinologist is called upon to treat the secondary and tertiary stages of the disease and it is therefore his skill in the management of these that will be of benefit to his patients, and perhaps the experience gained in treating lesions which can be seen may not be useless to the general practitioner.

In the treatment of syphilitic lesions of the nose and throat we should not only use vigorous constitutional measures, but should also make applications to the lesions where ever possible. In regard to the constitutional treatment the question arises, in what doses and for how long shall the patient be treated? The destructive character of these lesions in the nose and throat often demands that medication be pushed to the limit of toleration. And this must often be done quickly if we hope to save further deformity. To accomplish this it is often necessary to give a patient from 150 to 300 grains of iodids in the 24 hours and to continue this for many days. If the case is hard to control one-fourth grain doses of the protoidid of mercury should be given three or four times a day. Hutchinson claims that patients are more readily brought under the influence of mercurials if they take prolonged hot baths, and it is well to bear this in mind when dealing with cases which do not yield readily to treatment.

Patients differ greatly in their susceptibility to the influence of anti-syphilitic medication, and this should be given due consideration. Again, the stomach is likely to become irritable with large doses of iodids. This can be in a measure overcome by giving them largely diluted with water and after meals, and sometimes by the addition of elixir of pepsin. If the mercurials disturb the digestion they may be given by inunction or by subcutaneous injection. The principal point in the general treatment, especially if the case is at all urgent, is to reach the point of toleration for the individual patient and to continue near that point for some time.

The local treatment of these lesions is of the utmost importance and consists not only in the removal of all necrotic tissues as fast as possible, but also in the local application of antisyphilitic medication. We have also in syphilitic lesions of the nose and throat, to take account of infection by other bacteria, so that we have added to the syphilitic disease a suppurative condition. So far as my observation goes, syphilitic infection is not a pus-producing disease, and is not accompanied by suppuration in locations which are not easily ascessible to infection by other bacteria. Tissues infected by syphilis furnish good ground for other bacteria and this is especially noticeable in cases where the nasal chambers are involved.

This infection by other bacteria is very much favored by the accumulation of necrotic tissue, and for this reason all necrosis of bone or soft tissue should be removed as soon as possible and mild antiseptics should be freely used. Antiseptics containing mercury are better, as we then get in addition the local effect of the mercurial. The effect of the local application of some form of mercury is of the greatest benefit to these cases, and it is my practice to dust calomel over the lesion after as thorough cleansing as possible and to order mercurial ointment rubbed into the skin as near to the lesion as possible. If the ulceration has broken through upon the surface, I have the patient apply a plaster of mercurial ointment directly to the ulcerated surface and wear it constantly, until healing has taken place. By these local applications we render these lesions as readily amenable to cure as external syphilitic ulcerations in other parts of the body and these are well known to be the most successfully treated of all syphilitic lesions. I wish to call attention to the following conclusions:

First, that internal medication should be pushed to the limit of toleration for the individual case.

Secondly, that prolonged hot baths are of use in bringing the patient quickly under the influence of antisyphilitic medication.

Thirdly, that in syphilitic lesions of the nose and throat we have infection by other bacteria, and must therefore use antiseptics freely.

Fourthly, that the local use of mercurials renders these lesions as amenable to treatment as external syphilitic ulcerations in other parts of the body.

419 Boylston St.

VI.

TREATMENT OF LARYNGEAL TUBERCULOSIS.*

By J. Price Campbell Brown, M. D.

TORONTO.

As laryngeal tuberculosis, in a vast majority of instances, is secondary to pulmonary tuberculosis, the systemic treatment is practically the same in each. Hence this branch of the subject having already been thoroughly discussed, I shall confine my remarks to topical treatment, together with a few words upon general; diatetic and climatic considerations, specially bearing upon the throat.

First of all, the voice should be spared as much as possible. Sudden changes of temperature should also be avoided as well as dusty or irritating atmospere. The use of tobacco should under any circumstances be limited. Alcohol, when taken at all, should be freely diluted, and rendered bland, to avoid the irritation which it otherwise might produce, in the hyper-sensitive mucous membrane.

In reference to diet, it is well known that in this disease deglutition is often very painful, and in advanced cases, sometimes almost imposible.

Hence, when irritation exists, all food should be demulcent, or of a soft character. and of a temperature suitable to the palate of each individual case.

When ulceration exists, and the tissues are partially necrotic or destroyed, fluids are often difficult to swallow, the tendency for them to enter the imperfectly protected larynx being constantly present. To obviate this tendency semisolids or thick demulcent liquids should be given. The latter are best taken in gulps, like raw unbeaten eggs. Freudenthal has materially lessened the odynphagia and dysphagia in these cases, by the free daily administration of large doses of olive oil; the benefit being the result of the continuous lubrication of the diseased mucosa—the swallowing being made easier.

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*Read before the Toronto Medical Society in a discussion upon Tuberculosis, November, 1901.

Lake has obtained excellent results in these cases by adopting a modification of the German dish, "Bifsteck a la Tartare." Two ounces of raw beef, free from fat and gristle, are put through a mincing machine, and then intimately mixed with the yolk of an egg. In the worst cases of dysphagia, this preparation can often be taken.

Wolfenden has adopted a special method of overcoming this laryngeal difficulty with marked success. He instructs his patient to lie on a couch with the face downward over the end, the hips being elevated by resting on the knees. The patient then sucks the fluid from a tumbler through a rubber tube. By this means swallowing can be accomplished—the force of gravitation keeping the food out of the larynx.

In many cases a change of climate for patients suffering from tuberculosis is neither desirable nor possible; but when decided upon. the condition of the larynx and upper air passages should have an important bearing in the selection of the health resort. I laid a great deal of stress upon this point in a paper which I had the honor of reading before this society eight or nine years ago; and later experience has only confirmed the view then expressed.

As a general rule, it may be laid down that when the laryngeal tuberculosis is purely secondary to pulmonary disease, other things being equal, an elevated region of several thousand feet above the sea offers the best conditions for the arrest of the tuberculosis, owing to the rarity, dryness and purity of the air, and the stimulus which these give to fuller and deeper respiration.

On the other hand, when the tuberculosis has been preceded by laryngeal catarrh, and the disease has first proclaimed itself by hoarseness or soreness in the larynx, an atrophic condition of the upper air passages is often indicated. In such cases, change to an elevated, dry, rarified air can only do injury; while a sojourn in a favorable climate down by the sea, or a prolonged ocean voyage in properly selected cases, may be of highest benefit.

There are six different conditions which the tuberculous process may assume in the larynx: namely, anemia, hyperemia, infiltration, ulceration, necrosis, and the presence of new formations or growths. It is necesary to mention these, as the treatment varies somewhat according to the form in which the disease presents itself. Several of these conditions may be present in the one case at the same time.

In anemia the peculiar feature occurs, that while the mucosa of the arytenoids, ventricular bands and epiglottis may be pallid, the vocal cords are usually congested. In this condition, and when infiltration is commencing, the best results, in my own experience, have been obtained by spray treatment.

If the nose and pharynx are in an unhealthy condition, these should first be cleansed. Then an alkaline spray downward, through a curved instrument, will cause the expulsion of the mucus from the trachea and larynx. The second spray, to be used immediately afterward, should consist of an antiseptic volatile stimulant, dissolved in a bland aseptic medium. For the former, menthol, thymol, creosote, guaiacol, are among the most valuable; and for the latter any of the pure hydrocarbon oils, such as albolene, glycolene, petrolene, etc. Of these preparations I have found none so uniformly satisfactory for constant use as menthol in albolene of from one to five per cent. in strength. The immediate subjective effect is a sensation of heat in the larynx, followed by one of coolness and comfort. The objective or observant effect is that the pallid parts are cleansed and vivified, having become more or less pink in color; while the reddened vocal cords have become whiter and less congested, owing to the freer circulation throughout the larynx induced by the treatment. It is reasonable to believe, that if this effect can be produced once or several times a day in a weakened and diseased throat, the result should be beneficial.

Other methods of treatment recommended by authors are steam inhalations, medicated by oil of pine, eucalyptus, compound tincture of benzoin, creosote, menthol, etc., etc.; and to give ease during the process of inhalation, a few drops of chloroform are sometimes added.

In hyperemia we have a condition which occurs much more frequently in tuberculosis of the larynx than is generally supposed. The idea that the laryngeal mucosa in this disease is invariably pale is a mistake, being only approximately true. As Lake says: "There is a great difference between the larynx of a case of chronic phthisis and one of laryngitis tuberculosa in a phthisical patient. In the latter the efforts of coughing and the irritation of the pathologic process will in the majority of instances have set up considerable redness." To this might be added the fact that in acute miliary tuberculosis of the larynx, whether primary or secondary, there is usually considerable congestion.

The treatment in these cases is similar to that required in the anemic condition, with the exception that the sprays or insufflations used after the first cleansing treatment, should not be of quite so stimulating a character.

In infiltration or tumefaction, the methods of treatment advocated by different laryngologists vary greatly. Many laryngologists believe that until ulceration has occurred, operative treatment is never required, save for the relief of acute or chronic stenosis; while with others, operations of one sort or other are constantly being done.

Shurly has long advocated that linear incisions into the infiltrated tissue, in selected cases, are highly beneficial. They relieve the tension and do what nature herself would do at a later date; at the same time enabling the operator to directly medicate the diseased parts. In this he is supported by Bronner and other writers.

Lake strongly advocates the removal of interarytenoid thickening with cutting forceps; as he puts it "in almost every case." To use his own words, "in no class of case is the effect of thorough operation more satisfactory than in uncomplicated interarytenoid thickenings or vegetations." He also uses the electro-cautery wire to amputate the whole of the infiltrated epiglottis.

Gougenheim extirpates the arytenoid cartilages, for infiltration of the commissure, with punch forceps; under the belief that the primary cause is perichondritis or necrosis—a severe method of treatment which few laryngologists will be inclined to follow.

For these infiltrations, Chappell by a special instrument makes submucous injections of creosote, menthol, and oil of wintergreen in castor oil, from which he claims to have had excellent results. Donelan likewise has had recoveries through the agency of interstitial injections. He inserts a one minim dose of pure guaiacol into the most prominent part of the swelling; and like Chappell repeats the injection at intervals of about a week.

In ulceration, there appears for many years back to have been a general consensus of opinion in favor of the local application of lactic acid, notwithstanding the severe pain which its application produces. The advice is given to first apply a solution of cocain to the larynx: and then to rub into the ulcer by means of a laryngeal cotton carrier, lactic acid, commencing with a dilution of say 10 per cent.; and gradually increasing the strength from time to time until 80 or 100 per cent. can be borne by the patient. When applied in this way to the ulcerated surface, the pain frequently lasts for many hours. Freudenthal says often from ten to twenty; and is so terrible that the patients dread the treatment and will frequently resort to all sorts of excuses to avoid its repetition.

In my own experience the use of lactic acid in these cases has not been so adverse. This may possibly be owing to a different method of application. I have never used a weaker solution than 25 per cent., and usually the first application has been 50 per cent. instead, increasing from that up to acid of full strength. But then I have always considered it unadvisable to use friction. The method has been first to spray the larynx with a one per cent. solution of cocain. Then to apply directly on a cotton carrier a three to five per cent. solution, soaking the ulcerated surface pretty freely. Next a cotton pledget fairly saturated in the lactic acid solution is pressed gently upon the ulceration—but without any friction whatever—the patient being instructed to breathe gently and regularly while the application lasts. By this means the lacticated cotton can be kept in contact with the diseased surface for many seconds without producing either laryngeal spasm or pain.

The difficulty that I have unfortunately experienced, when attempting friction, is that the sensitive organ, although cocainized, rebelled. Spasm was produced; and by the contraction of the intralaryngeal muscles, the fluid was squeezed out of the cotton sponge, and forced downward between the vocal cords and into the trachea. Not only so, but the friction of the acid upon the ulcerated surface seemed to aggravate and prolong the suffering without being counterbalanced by any adequate good.

When applied in the way suggested, the saturation point being limited, a stronger solution can be used; thus compensating for any supposed advantage, derived from the friction by a weaker drug.

Of course, as in the treatment of the other conditions already described, the larynx and trachea should be cleansed before applying the cocain by the free use of an antiseptic alkaline spray.

Lennox Browne recommends the application of a 20 per cent. solution of menthol in olive oil.

Freudenthal has found a menthol-orthoform emulsion of his own device of great benefit in these cases, and free from the pain-producing effect of the lactic acid. In this preparation the orthoform has a fixed ratio of $12^1/_2$ per cent. while the menthol varies from 1 to 15 per cent. according to the condition and requirements of the patient. He applies the emulsion by injection, using as a prior application, a powder of saccharated suprarenal gland for its anesthetic effects—thus doing away with the necessity of using cocain.

In my own experience, what might be called "progressive use of menthol," has been very beneficial in checking the ulcerative process and reducing infiltration in laryngeal tuberculosis. The anesthetic effect of weak solutions of menthol upon the mucous membranes of the pharynx and larynx is well known. This occurs, although in a minor degree when using cocain, without producing the depressing effect incident to the use of the latter drug.

Hence, after cleansing the larynx with an alkaline spray, I throw into it freely with the down curve of an atomizer a 1 per cent. solution of menthol in albolene. This is followed in two or three minutes by a 5 per cent. solution; and if deemed advisable, after an equal interval, by a 10 per cent. or even stronger. The remarkable thing is that the patient will frequently affirm that the last spray of menthol in albolene, although ten times as strong as the first, does not hurt nearly so much.

Intralaryngeal insufflations of powders, such as iodoform, aristol, europhen, dermatol, pyoktanin, etc., etc., have frequently been used, but they have not met with very wide favor; as from their drying dessicating character, they produce little but discomfort for the patient. They may check the discharge of pathologic secretions and hinder elimination.

It is to Krause and Heryng that we are indebted for the use of the curette in the treatment of tubercular ulceration of the larynx. Under cocain anesthesia, the ulcers are operated upon either with the single or double instrument, the entire ulcer being cut away if possible. This is not, as a rule, attended by much hemorrhage. The application of a solution of adrenalin prior to operation will make the bleeding even less. The rule has been, upon checking the hemorrhage, to apply the diluted lactic acid to the raw surface, the latter to be repeated from time to time during the process of healing. In many cases, by this method of treatment, the progress of the laryngeal disease is checked, and in some cured.

Still many laryngologists consider the method too heroic, and too questionable of ultimate good to be practiced except in rare cases. Bryson Delavan has expressed himself on the whole as in favor of milder measures; and Lennox-Brown, speaking of the combined curettement and use of lactic acid says: "But the cases must, I think, be rare in which the treatment would be justified by the result."

Gleitsman advises galvano-cautery operations upon the infiltrated posterior commissure, when dyspnea and odynphagia are well marked. I have personally had several opportunities of endorsing his experience upon this point. One advantage of this method of operation over curettement and excision by cutting forceps, etc., is, that when properly performed, it does away with all possibility of auto-infection. The main points are, 1st, to insure a perfect attitude of stillness of the larynx while operating, and 2nd, to accurately gauge the extent of the burning incision. The second is but a corrollary of the first. The larynx should be thoroughly cocainized, and then during the operation the patient's undivided attention should be devoted to uninterrupted and regular breathing.

Scheppegrell advocates the use of electrolysis or "cupric interstial cataphoresis" for the disintegration of the tubercular deposit; and has invented a laryngeal electrode to promote the absorption of remedial agents into the diseased tissues.

Necrosis may attack any of the cartilages of the larynx; and frequently the epiglottis is the chief seat of sloughing. Fortunately, however, this condition is rarely attended by severe hemorrhage. The tubercular nodules are non-vascular, and being surrounded by epithelial cells, imbedded in a zone of granulation tissue, and this itself surrounded by small-cell infitration, it can readily be seen that the likelihood of severe hemorrhage is limited. The consequence is that in necrotic conditions, spray treatment to cleanse the diseased surfaces and stimulate to a better blood supply (together with scraping away the dead tissue) is about all that can be done apart from anodyne applications to relieve pain. The advisability of scraping itself is still an open question.

When deglutition is very painful, sprays of cocain or eucain, or the two combined are called for. The latter produces less nausea than the former; and the limit of saturation of eucain being 5 per cent. in aqueous solution, it will probably be the safer one to use.

Further range of surgical measures is somewhat limited. Papillomatous growths, the result of progressive ulceration, may require removal by evulsion, snares, or escharotics, especially when they occur about the vocal cords or ventricular bands. Occasionally they form without ulceration, and assume the shape of ordinary papillomata with sessile base. These, when interfering with respiration or phonation, should be removed.

Intubation can scarcely be of any use in laryngeal tuberculosis, as the stenosis is almost always above the vocal cords, upon which the flange of the tube is supposed to rest.

Tracheotomy, too, can rarely be advisable; perhaps only for the relief of impending suffocation; and there are few instances on record in which it has even then prolonged life for more than a few days or weeks.

There is one other method of treatment that I have reserved to the last, inasmuch as it applies as well to pulmonary as laryngeal tuberculosis. I refer to the administration of intratracheal injections. In many of the most recent works on laryngology, such as those of Lennox Brown, Kyle, Shurly, Bishop, Price-Brown, etc., if mentioned at all, it is only in the most incidental manner. There have, however, during the present year, been two excellent monographs written upon the subject, the one by Thompson of Cincinnati, and the other by Anderson of Detroit. Lake, too, in his new and excellent work on laryngeal phthisis quoted very favorably of it; and gives an illustration of his own intratracheal syringe devised for administering the injections required. Another surgeon, by the name of Thompson in 1852, and Bing in 1865, are both reported to have used intratracheal injections with the expectation of curing pulmonary tuberculosis in this way—failing in the effort, the treatment fell at once into disuse. Later it was revived again, and Downie wrote in the *British Medical Journal* favorably upon it nine years ago.

For some months now I have used intratracheal injections for chronic laryngitis and laryngeal pulmonary tuberculosis in a number of cases with promising results, although it is too soon to place any proper estimate upon the value of the new method of treatment.

The early injections were chiefly aqueous solutions, with the addition of glycerine; and although good results were reported, it was not until oil was substituted for the water, that the full beneficial results began to be realized, the oleaginous applications being so much less irritating. Of the various oils that have been used, none seem to suit the conditions so well, as the purified hydrocarbons, extracted from crude petroleum. Besides the essential qualifications of blandness and softness, these possess the additional advantage of not being culture mediums.

The most effective medicines for use by the intratracheal method are the same that are used for stimulating sprays, stereoptenes like menthol and thymol, and methyl-ethers like creosote and guaiacol; substances that are soluble in oils and that will volatilize slowly at the temperature of the body, the vapor from them reaching not only the larynx but all parts of the lungs as well. The strength of the solutions should be from one-half to two per cent.

The writers mentioned claim that from 4 to 8 cubic centimetres of the menthol-camphor solution of one or two per cent. strength, can be injected into the larynx without producing irritation—the larynx being bathed with it and the whole bronchial tree medicated at the same time. The solution is felt by the patient in the bronchial tubes, and the odor can be detected in the breath of the patient for hours afterward. In the latter lies one of the essential benefits of the treatment; as in the act of expiration the vaporized drug is brought in direct contact with the diseased laryngeal tissues.

One of the immediate results of the treatment is a warm pleasant glow felt throughout the lungs, and extending over the entire body, even to the hands and feet. Another is the rapid cessation of cough, the larynx feeling soothed and comfortable, the sensation lasting in some cases for hours.

Menthol may be used of the strength of one to two per cent; thymol half to one per cent. guaiacol one per cent. creosote one per cent.

A stronger solution of either of the latter would produce pain. Chlorophenol may be used in small doses, say 1 c. c. of one per cent. Of any of the others, the dose might be from 4 to 8 c. c.'s repeated once a day.

Lake is the only one of the writers mentioned who has referred to the matter of temperature. I may say, however, that in every instance that I have used this method, following his suggestion, I have first heated the instrument in warm water; and then filled it with the oil at blood temperature. By the use of the laryngoscope, the tip of the instrument was then guided over the epiglottis, and the patient instructed to inhale slowly while the stream was poured into the larynx. Up to the present I have confined my own treatment in this line to the injection of one to two per cent. of menthol in albolene, the amount injected varying from 4 to 8 c. c. repeated every one or two days.

It is worthy of note that when thus given, and without using cocain at all, the patients could scarcely feel the entrance of the fluid; but toward the latter part of the inhalation the contact of the oil within the bronchial tube would produce a slight cough, though only of short duration.

So far, every patient that I have treated in this way, whether suffering from chronic bronchitis or tuberculosis, has expressed satisfaction with the new method of treatment.

VII.

A YEAR'S EXPERIENCE IN THE TREATMENT OF THE EUSTACHIAN TUBE BY MEANS OF THE ELECTRO-BOUGIE.*

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No contribution in recent years to the treatment of catarrhal disease of the middle ear has excited greater interest and offered more promise of success than that proposed by Duel in a paper read before this society in Cincinnati in 1899, entitled The Value of Electrolytic Dilatation of the Eustachian Tubes in Chronic Tubal Catarrh and Chronic Catarrhal Otitis Media. Since this original paper by Duel, many aurists in different parts of the country have been testing the value of electrolysis, and papers have appeared by Kenefick, Brandegee, and others. Any method of true merit welcomes the fullest investigation. With an idea of further testing the value of this method, the writer has devoted most of his time in the ear department of the Manhattan Eye and Ear Hospital for the past year to the application of electrolysis to suitable cases. The subject has been approached without bias and in an entirely impartial spirit. This work was rendered possible by and at the suggestion of Dr. Wendell C. Phillips, who afforded every courtesy and opportunity for making these investigations in his clinic. Out of over 75 cases referred, some 33 were regarded as suitable. These, with the two exceptions to be noted, all showed the presence of stricture in one or both tubes. Each case was carefully tested with acoumeter and tuning fork at the beginning of treatment; many had previously received a full course of treatment by means of the catheter. So far as possible, the technique as practiced by Duel was followed out. A Wappler machine was employed in connection with the street current. In a majority of the cases a silver catheter wound with thin rubber was used; later on a hard rubber catheter was substituted. Care to sterilize all instruments was continually exercised. A current of not more than three milliamperes was the rule—in every instance, the sign of "bubbling in the ear" was sought for—and no increase in the strength of the current was made after that point was reached. As little force as possible in advancing the bougie was employed. Inflation after bougieing was always avoided. The negative current was employed for a period not exceeding five minutes. In each instance, with the exceptions to be noted, the bougie was caused to enter the tympanum. The bougies were the graded old bougies made by Ford.

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*Read at the seventh annual meeting of the American Laryngological, Rhinological and Otological Society, held in New York on May 24, 1901.

Among the questions sought to be answered were:

(a) The value of electrolysis as compared with other methods of treatment in the relief of tinnitus due to middle-ear catarrh.

(b) Its relative value in improving the hearing.

(c) How permanently the structure is relieved.

(d) What dangers, if any, lie in its use.

(e) What is the true nature of the process or phenomenon taking place.

In the 33 cases treated, 26 had tinnitus of a chronic nature (no acute cases). Of these 26

1 was cured.
13 were improved.
12 were not improved.
—
26

Seventeen of the 33 complained only of hard hearing. Of these

12 were improved.
5 were not improved.
—
17

No. of Case	Age	Sex	Tinnitu	Tuning forks C	IV C.	Whispered voice	Acoumeter	Situattion of Stricture	No. of times bougied	Whispered voice last test	Acoumeter last test	Tinnitus	Length of observation	Condition of tubes
1	28	F.	Yes	A. C. 0 / B. C. 25	10/15	8″	8″	1 in	8	20″	20″	im-pr.	m.	open
2	22	F.	No	0/17	12/2	6″	20″	1 in	9	45″	6′	no ch.	4 mns.	“
3	38	F.	Yes	24/13	12/5		15′	¼ in	4			“	2½ mns.	stricture reformed
4	23	F.	Yes	0/8	8/3		2′	¾ in	4			“	2 mns.	open
5	31	M.	Yes	25/8	10/7		30″	mouth and isthmus	7				2 mns.	“
6	27	M.	No	10/14	7/0		20″	1 in	4		30″		2 mns.	admit bougie but much swollen
7	21	F.	No	10/25	20/10	15″		1 in	10	6′			1 yr.	
8	24	M.	Yes	17/30	18/	20″	5′	1 in	6		6′	im-pr.	6 m.	open
9	30	M.	Yes	10/17	5/7	30″	20′	1 in	10	4′	but does not think he hears better		6 m.	
10	20	M.	Yes	10/5	3/9	1″		mouth and ½ inch	8	1½″		no ch.	3 m.	Tinnitus ceased for a time, tubes very much swollen
11	40	F.	Yes	0/12	8/0			1 in	3			“	5 wks.	
12	24	F.	No			3″		1 in	4	3″			5 wks.	open
13	18	F.	Yes	10/15		15″		1 in	4	15″		gone	2 mns.	narrow
14	33	F.	No	12/15			30″	1 in	5		30″		3 mns.	stuffed up hearing gone
15	69	F.	Yes	01/10	6/0	20″		none	1	20″		no ch.		open
16	26	F.	Yes			30″	30′	1 in	6	30″	30′	im-pr.	3 mns.	adhesion at mouth
17	49	F.	Yes	25/10	5/0		4′	1 in	3		4′	“	1 mn.	open

That is to say, as regards tinnitus, 55 per cent. were cured or relieved, and as regards hearing 72 per cent. This can be compared with Duel's results of 42 cases of tinnitus, where 38, or 90 per cent. were relieved in whole or in part. An analysis of the 13 cases of tinnitus reported above as improved is in order, inasmuch as improvement may be much or little, temporary or permanent:

Case 1—After three months of treatment, reports tinnitus lessened in degree, but still persisting. No previous treatment.

Case 2—Three months under treatment. Much relief to tinnitus, which at times ceases. Much previous treatment.

Cases 3, 9 and 10—Some improvement.

Case 4—Three treatments; no decided improvement, but patient was relieved.

Case 5—Relief [to tinnitus, but it was not permanent; stricture dissolved.

Case 6—Decided benefit. No other treatment availed; but no stricture present.

Case 7—Considerable improvement, but stricture never passed. Three months of weekly treatments.

Case 8=Tinnitus lessened, but persisting; character changed.

Case 11—Tinnitus lessened, but persisting; character changed.

Case 12—Immediate and marked improvement. No previous use of celluloid bougie.

Case 13. Two treatments only. A slight improvement followed, but the patient disappeared from observation.

In brief, of these 13 cases reported as improved,
2 were much relieved,
9 were partially relieved,
1 was much relieved, but no stricture was present,
1 was only temporarily relieved.

Of the two cases reported as cured, one disappeared after the second treatment, and no subsequent report could be obtained from either until recently, when the second patient returned at the end of four months and reported the tinnitus as bad as ever.

We can then with certainty point to only 2 cases out of 25, where strictures were present, in which permanent and marked relief to the tinnitus was experienced.

A further analysis of the 12 cases where there was no improvement shows that all were classed as mixed or sclerotic (combined involvement of middle and internal ear).

Strictures were encountered in every instance and successfully passed, except in two cases. In one case electrolysis caused an increase of the tinnitus.

A similar study of the 12 cases where improvement in the hearing was noted, reveals three in which the improvement was only slight—about three inches; in 3, the gain was from six inches to three feet for the whispered voice; while in the remaining six the improvement was noteworthy—four feet to twelve feet. In short, real benefit to hearing was made in 8 of the 17 cases, or in a little less than half. Later examination of two cases shows all improvement lost.

Two patients who complained only of a sense of fulness in the ears—one of them after much previous treatment by the catheter—were slightly relieved. One case of persistent non-inflammatory pain in ear, resisting all other treatment, was much benefitted.

An important question is how permanently the strictures are relieved. Here my experience is at variance with Duel's. In many instances, after thoroughly opening the tube and passing the stricture into the tympanum, at our next electrical treatment, although the ears had been carefully inflated in the mean time, a reforming of the obstruction was met with. This was particularly true in Case 7, where, after two months' absence, the work had to be done over again. This patient never made the same improvement after the second course of treatment, gaining at first fifteen feet, and later only from four to six feet. We are convinced, too, that the electric current is capable, even when properly used and within moderate limits of strengths, of causing adhesions in the tube. One instance of this was particularly well demonstrated. It was the case previously referred to as presenting catarrhal pain in the ear. Several strictures were encountered and passed, with much relief to pain. The "bubbling" symptom was met with only at current strengths of from 4 to 5 milliampères. At an interval of a month, electrolysis was again tried, but all attempts to introduce the bougie failed. It was an unusually favorable case to see that the catheter was in the

No. of case	Age	Sex	Tinnitus	Tuning Forks C.	IV C.	Whispered voice	Acoumeter	Situation of Stricture	No. of times bougied	Whispered voice last test	Acoumeter last test	Tinnitus	Length of observation	Condition of tubes
18	31	M.	Yes					1 in	1			worse	1 mn.	open
19	32	F.	Yes	A. C. 3 / B. C. 7	3/		1·2″	1 in	4		1″	improved	7 wks.	"
20	32	M.		17/8	0/0		1″	1 in	6		1″	no change though at times better	2 mns.	"
21	60	M.	Yes	10/17	7/0		0	none	6		2″	improved	2 mns.	"
22	19	F.	Yes	0/20			7″	1 in	5			"	2 mns.	stricture not passed
23	49	M.	Yes	0/15	5/0		0	1¼ in	6		0	"	2 mns.	open
24	46	F.	Yes	3/20	5/0		3″	1 in	6		36″	no change	1 mn.	narrow and stricture reformed
25	39	M.	Yes					1½ in	1			slightly improved		open
26	22	F.	Yes	0/10	5/3		0	1 in	2		1″	no change	3 mns.	"
27	32	F.	Yes	0/10	4/0	0	2′	and ¾	6	4″	4′	improved	2 mns.	stricture reformed
28	23	F.	Yes	10/19	7/5	12″	2″	1 in	9	10″	3″	"	10 wks.	open
29	28	M.	Yes	10/17	15/6			½ in	3		2′	"	3 wks.	"
30	47	M.	No	18/10	9/0	15′	15″	1 in	3	15′	15″	pressure gone	3 wks.	"
31	22	M.	No	0/25	0/0	0		none	3	0			2 mns.	"
32	25	F.	Yes	0/10	10/0				2			improved	1 mn.	"
33	40	M.	Yes	10/0	8/4		8′	1 in	3			no change	1 mn.	"

right position, for there was a marked cleft palate admitting of direct inspection, and revealing adhesions directly at the pharyngeal mouth.

In this connection it may be said that, in our experience, bubbling is not always a reliable sign. In many instances it will be noticed by the patient at 1, 2, or 3 milliampères. In other cases, 5, 6, or 7 milliampères have to be reached. Several times the patients reported a similar bubbling after removal of the bougie, and in at least three cases no bubbling was ever secured; only increased tinnitus or pain, such pain always evidencing the cautery effect of the current. Care was exercised in each case to secure as thorough asepsis as possible. In spite of this, suppuration of the ear followed in four cases. In three of these cases the recovery was rapid, ten days to two weeks, and was unattended by any unpleasant sequelæ, not even reducing the hearing for a long time. The fourth case deserves to be reported at greater length.

The patient was a young lady, twenty years of age, who presented herself for hard hearing. An operation for adenoids and septal exostosis was performed. This was followed by an attack of grippe, confining her to bed. This seemed to be a relapse from a previous attack just before she entered the hospital, not known about at that time. Upon what appeared full recovery, electrolysis was applied to the tube opposite to the side of the nasal operation. A slight stricture was encountered and passed at 1 7/16 inches. Improvement in hearing was noted, with no unpleasant results. The following week the bougie was again introduced. This time no stricture was met, but at exactly 1 1/2 inch, as was carefully ascertained after removal, a distinct snap was heard both by the patient and myself, followed by severe pain. Examination showed that Shrapnell's membrane was much reddened. The pain disappeared for three hours, then returned with much severity. I saw the case on the day following or at the end of twenty-four hours, found a bulging drum, and performed a paracentesis. Examination of the discharge showed many streptococci. No pain over mastoid. The day following, pain developed in the mastoid and five days from the electrical treatment I opened the mastoid, and found pus. The recovery was uneventful and no permanent loss of hearing was sustained.

Here, clearly, there was a short Eustachian tube. One and a half inch meant a forcible tenotomy of the tensor tympani, or possibly a luxation at the incustapedial joint. It is questionable if even this could cause all the disturbance which followed without the presence of bacteria. These could have been introduced by means of the catheter or bougie, in spite of the care which was exercised. As these had been properly sterilized it is possible that bacteria were already present in the ear as a result of the grippe, and that the traumatism served thus as an exciting factor. This case is full of significance. We feel that it is time to sound a warning note against the widespread use of the method on the ground of its entire freedom from danger. Recently we have heard of still another complication. In two cases, in the hands of an experienced, competent man, the bougie has broken off *in situ*.

We may conclude:

1. That the assumption that the length of the Eustachian tube is 1 1/2 inch in all cases, is an unsafe rule to follow, and that, beyond 1 1/4 inch the greatest care is to be exercised as to its further introduction. We are told that we learn when we have entered the tympanum by the touch gained by experience, but this experience may be gained at too great a cost.

2. That too scrupulous care in the way of antisepsis cannot be exercised. The experience of Duel was that force in advancing the bougie was not necessary; this has not coincided with ours. In many cases, it is true that mere contact of the bougie caused a dissolving of the stricture. In others a considerable amount of pressure needed to be employed. To know just how much force to use in a given case is often a delicate matter. The liability to cause a false passage is constantly to be borne in mind. This has actually occurred in the experience of several of my confrères. In two cases it was impossible after repeated efforts—and using as much current and force as seemed warranted—to pass the obstruction. It gave the sensation of a wall of bone.

The nature of the process is full of interest. In our mind there seems considerable question whether it is truly an electrolytic process. It seems scarcely possible to believe that a fibrous mass of years' duration can be dissolved in thirty seconds, as is often the time in which a stricture gives way, by a two-milliampère current exerting its influence, not merely on the end of the bougie, but also over its sides. It is not an infrequent experience to find that a stricture which has been originally passed could not be passed at the second sitting, but at the third sitting no difficulty in passing it was encountered.

Following the suggestion made by Dr. J. F. McKernon at a recent meeting of the Section in Otology of the New York Academy of Medicine, several cases of dilated tubes were subjected to the treatment. In one case only was there decided benefit to tinnitus and hearing. Here, a reflex action on the auditory nerve was probable.

A still weightier question is the true nature of the obstruction we meet with, which we commonly designate a stricture. Does there really exist in most cases a true fibrous deposit, causing narrowing or actual obstruction? Repeatedly we could succeed in getting good inflation sound when the bougie encountered an obstruction, and, as has just been stated, an obstruction present one day and impassable, was strangely manageable the next day.

Much emphasis is to be put on the necessity of following up our cases to get the true results. It will be recalled that several patients reported as cured or improved, returned at a later period without any improvement. It is a question whether some of the cases would not have shown improvement equally well without the electricity, using only the bougie.

Electrolysis, while a new procedure in the ear, has been used for years in the urethra. Dr. Robert Newman has been its most energetic supporter, asserting that it affords a certain and permanent cure to urethral stricture, if properly applied.

That his views are not held by all workers in that specialty is shown by the conclusion to an article on the subject by so distinguished a syphilographer as Dr. E. L. Keyes, who, after a careful study extending over several months, says:

"My study of the subject and the experience it has brought me, digested with all the impartiality I possess, lead me to state that the allegation that electricity, however employed, is able to remove organic urethral stricture radically, lacks the requirement of demonstration. The confidence of its advocates that it will *radically cure organic fibrous* stricture is, in my opinion, due either to the combined *credulity* of the patient and the *imagination* of the surgeon, or to some special but *fortuitous* act of Providence, upon the co-operation of which, in the case of his own patients, the general practitioner cannot with any confidence rely.''

We feel warranted in drawing the following conclusions:

1. The electro-bougie has a place in our aural therapy—though a less important one than was at first supposed.

2. It should be used after and not before other methods of treatment.

3. It will be most liable to fail if any associated internal ear disease is present.

4. Its results are not always permanent—the stricture may re-form—we may hope rather for a diminution than a disappearance of the tinnitus.

Two cases totally relieved out of 25.

Two cases partially relieved.

5. Its use is not without danger—and a proper knowledge of the anatomy of the parts and of the technique is essential.

6. It is a question whether the process is a true electrolytic one, or if in many instances the obstruction is a true fibrous stricture.

117 East Fortieth Street.

VIII.

CONTRIBUTION TO THE STUDY OF ANTRECTOMY.*

CONSIDERED AS AN OPERATIVE MEANS AND A PRELIMINARY STEP TO OPERATIONS NECESSITATED BY THE COMPLICATIONS OF MASTOID SUPPURATIONS.

By Dr. Olivier Lenoir,

Translated by Hanau W. Loeb, A. M., M. D., St. Louis.

INTRODUCTION.

This essay, which received the Laborie Prize of the Société de Chirurgie of Paris, is the record of work done in the laboratory of Professor Farabeuf when I had the honor of being his assistant. I was inspired in much of my work by the oral instruction of this eminent anatomist, and three of the figures in this work were received from him.

I have been guided, directed and sustained in these investigations by Auguste Broca. As will be seen, they have warranted me in recommending an operative procedure which was employed and advocated by him for several years and which, in his hands, has proved its worth. Without his kind collaboration it would have been impossible to carry out the work.

I desire to call the reader's attention to the original plates which I have designed from my preparations and dissections.

These investigations alone permit me to establish and to fix, with full knowledge of cause, a positive and harmless method of examining the antrum; I will add, at all ages, which is important, since the technique of the operation in children is so poorly described in most books that I might say that it is completely wanting.

I have not overloaded the text with the bibliography of the subject; this will be found arranged in .alphabetical order at the end.

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*Revue de Chirurgie, July, September and October, 1901.

I.—ANTRECTOMY DESERVES TO BE STUDIED NOT ONLY AS AN OPERATIVE PROCEDURE, BUT ALSO AS A PRELIMINARY STEP TO OPERATIONS NECESSITATED BY THE COMPLICATIONS OF MASTOID SUPPURATION.

A monograph on antrectomy, its indications and contra-indications, its clinical and operative results, will be sufficient of itself to fill these pages. As I have said, my study has not been undertaken to make a resumé of what has been written and said about this operation.

I shall consider my purpose fulfilled if I can demonstaate on the one hand that the operation is easy, not only for experts but for the practitioner who is but slightly familiar with instrumentation, and, on the other hand, that it can be considered as the procedure of choice in interventions required by suppuration of the mastoid process.

My arguments and conclusions, in default of other merit, will have that of being supported by dissections and operations. Is not anatomy the foundation of operative medicine, and without it can there be proper clinical intervention?

That trepanation of the mastoid process may be in general made easy, that the opening of the antrum should never be dangerous—what a novelty to establish in these days of great surgical progress!

However, this operation, like all others, exacts preliminary knowledge which cannot be substituted by surgical dexterity.

Trepanation of the mastoid was formerly considered dangerous. I remember having seen the sinus opened on three occasions by surgeons properly considered as expert operators. And, errors excepted, a fair number of antrectomies are followed by facial paralysis. I speak only of facts fully acknowledged by practitioners. I believe then that no one will dream of reproaching me for seeking to establish, in a precise way, the operative rules for opening the antrum.

The best proof of the necessity for an operative manual arises from the decided divergence of technique which was announced by Ricard in 1889. According to experience a multiplicity of procedures to accomplish the same result shows that the knowledge of the subject is not complete.

The number of works is being multiplied, especially in France, where the interesting monographs of Duplay, Ricard and A. Broca have firmly grounded the anatomy and surgery of the mastoid process.

But the title calls for something more and better than antrectomy, viz., that this operation constitutes the preliminary step in most of the interventions directed against the complications of otitis media, and that it is in the absence of complications the best means of avoiding them. In every case where pus spreads toward the mastoid cells toward the meninges, the brain or the sinus, does it not begin by invading the antrum? It is then not unreasonable to go, from the very first, to the point where the infectious agent starts in its ravages. Manifestly it is well in surgery to trace the origin of pus, but when this is done, is it not best to go to the source direct?

I maintain that all of the complications of otitis media may be relieved by antrectomy, especially simple suppuration of the cells. I do not admit an unlimited belief in the opinion of Politzer that, in mastoiditis consecutive to grippal otitis, resection of the mastoid surface is sufficient in most cases. It seems to me that such resections may be classed with Wilde's incision, which has lived its day and which is only applicable in mastoid periostitis. It is true that among surgeons who are content with stripping off the mastoid, some may be found like Hoffman of Königsberg, who declares that his patients are improved, when no pus is found, and who claims that the operation acts in these cases as iridectomy in glaucoma by causing diminution of the brain pressure. I must condemn superficial curettage, the results of which are hardly better than the temporary expedient proposed by Loewenberg and Pauzat who considered trepanation as the exception, while I look upon it as the rule in these cases.

I believe that Hessler of Halle is in error when he makes an excision of the cells without opening the antrum. If it is desired to treat the mastoid cells why not look after the source of pus, the one cell which is always present, the antrum? Why not perform antrectomy? It is the antrum which should be investigated, since it is the only cell which exists in all ages.

Duplay, who taught us to differentiate periostitis from mastoiditis proper, advises that the antrum should always be opened when suppuration of the cells is present.

A. Broca insists upon the necessity for trepanation even if the bone seems healthy under the periosteum loosened by the pus. I shall not consider, except for purposes of reminder, the evident facilities furnished by antrectomy for cleansing the attic and for various special operations upon the ossicles ankylosed or bathed in pus—I address myself not to specialists but to surgeons. I am desirous of bringing to light the utility and necessity for antrectomy in the treatment of the intracranial complications of otitis media.

Through the agency of asepsis, surgical intervention is justifiable in a fair number of meningeal and cerebral complications of otitis. Sinus phlebitis is also a matter for intelligent and courageous intervention.

It is all the more logical to consider antrectomy as the first step in these operations, as, if there is a cerebral complication, it most frequently attacks the side upon which the otitis is, without there being necessarily denuded bone corresponding to the cerebral suppuration.

Nothing is easier than to make a passageway to the cranial cavity by way of the antrum. This will be readily perceived after studying the anatomy of the mastoid and of the antrum, and the means of entering this cavity.

II.—PERSONAL INVESTIGATIONS UPON THE ANATOMY OF THE MASTOID PROCESS; STUDY OF THE OPERATIVE LANDMARKS AND DANGERS.

No pretense is suggested of presenting the complete anatomy of the mastoid process and adnexa of the middle ear; I pass over rapidly the points which have not been made the object of personal study.

Perhaps the development of this part of the work which is intended to be surgical will be found most important. But when it concerns operative medicine, one cannot do too much to elucidate the knowledge of the grounds upon which intervention is based. Too much importance cannot be placed upon the study of the different landmarks by virtue of which the surgeons make an exact section. In this experimental study I intend to show the nature of the mastoid, the disposition of its cells and the different landmarks which permit trepanation with complete security.

Another part, in my opinion more important yet, is devoted to the situation of the organs which it is indispensible to map out in antrectomy, either simple or complicated by more serious operative indications. It is necessary to know not only where to attack but also where to pass—and what to avoid.

Finally, I must remark that my investigations have been made in adults, adolescents and children. For want of sufficient data, an operator is liable to fall into the grievous habit of extending to children and adolescents the operative practice which should be reserved for older subjects.

ANATOMIC GENERALIZATIONS. The mastoid process is situated on the external surface of the temporal, behind the auditory canal. It has a slightly oblique direction from above downward, and from behind forward. It is most frequently conoidal. Its anterior border, thick and rounded, is distinctly vertical; its posterior border is in adults inclined about 45° downward and forward.

The apex is generally teat-like, and affords attachment to the muscles, which do not concern us. I may mention the mastoid foramen, situated behind its upper portion. This foramen, whose existence and dimensions are variable, gives passage to a vein which generally joins the lateral sinus. It is evident that the size of the mastoid process depends, for one thing, upon the power of the muscles attached to it. I may state that it generally agrees with the osseous dimensions of the individual.

I have had occasion to see in the Anthropologic Museum, in Manouvrier's collection, the skeleton of a giant in which the mastoid process, truly monstrous in size, was in striking contrast to that of a dwarf in a neighboring case.

The Size of the Mastoid Process. But the size of the mastoid process is nearly always in direct relation to the age. The plates here presented are in this respect a perfect demonstration. In the fetus at term (see figures 9, 10, 11, 12, 13, 14) there is, as it were, no mastoid process. In children three years of age (see figures 15 and

16), and in those of five years of age (see figure 17) it is already perfectly outlined; at the age of 13 years (see figure 18) it shows in miniature the form of the adult's (compare figures 1, 2, 22, 23, 25, 26, 27, etc.).

This difference in size of the mastoid occurring in different ages may surprise us, since certain parts of the temporal, the ossicles for example, are almost (a curious fact) fully developed in the fetus at term. We find the explanation in studying the development and constitution of this part of the temporal.

DEVELOPMENT OF THE MASTOID PROCESS. Two portions of this bone unite to form the external surface of the mastoid process, the squamous portion anteriorly and superiorly, and the petrous portion inferiorly and posteriorly. We note, and this is important, that the tympanic ring takes no part in this formation. The union of these two pieces, schematically shown in Poirier's treatise on anatomy, results in a suture, the mastoido-squamous suture (s m s in figures) which runs upon the external surface of the process, starting from the parietal incisure and ending anteriorly and superiorly upon the tip, without it being possible, it seems to me, for one to feel the terminal notch as Chipault represents.

LANDMARKS.

THE MASTOIDO-SQUAMOUS SUTURE. According to the forgoing, it will be seen that the volume of the mastoid process is in direct proportion to the osseous portion behind and below. However, in the fetus and in young children, the exocranial face of the petrous portion does not exist, as it were. We should therefore not be surprised that the mastoid process is not observed in subjects of this age.

I insist upon this fact, that I have always found in the dry crania of all ages examined, traces of the mastoido-squamous suture under the form of a furrow, more or less irregular and uneven. It is still easier to observe it in the living or upon the cadaver by scraping the external surface of the process. In this position considerable effort must be made to detach the periosteum, which penetrates it in the form of an easily recognizable, whitish fascia.

A portion of the squamous forms therefore a part of the process. This squamous portion is limited by a transverse ridge which, as we shall see later, is important from our special point of view. This is the supramastoid ridge (c m s in the figures), the prolongation of the zygomatic process, describing a curve with an antero-superior concavity (is this the horizontal ridge which Chipault describes?) This ridge, projecting more or less according to the subjects, seems nearly constant in children, as can be seen in a table which will be presented later.

Supramastoid Ridge. The supramastoid ridge corresponds to the floor of the middle fossa; it is situated sometimes at exactly the same level, but almost always a little above (Chipault). We will see that these variations in the mastoid surface establish the landmarks for antrectomy. Its importance is so great that I think it deserves a special study.

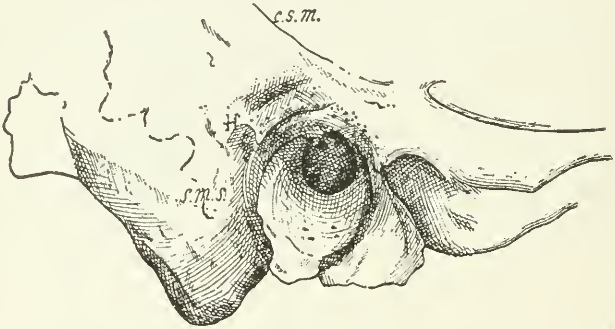


Fig. 1. Typical position of Henle's Spine. It is seen that it is not continuous with the tympanic ring. *csm.* supra-mastoid ridge.

Henle's Spine. Upon the external surface of the temporal, below the origin of the supramastoid ridge, above the posterior-superior fourth of the osseous auditory canal is found a rough projecting spine in the form of a curved lamella, almost concentric to the circumference of the osseous canal. This is the spine of Henle, "spina supra meatum" of the Germans, "épine tympanale" of Poirier (H in our figures). This eminence in the form of a lamella describes a curve with an antero-inferior concavity, its anterior extremity being always nearer the circumference of the osseous canal than the posterior.

Henle's spine is not situated exactly upon a plane tangent to the surface of the mastoid but somewhat deeper. In order to uncover it in operating on the mastoid, it is necessary to push the instrument as if one wished to penetrate into the postero-superior segment of the osseous canal. It is bounded posteriorly by a vascular zone which varies in different subjects; these differences resulting perhaps from ethnologic conditions. Sometimes this is a simple cleft like a scratch, the borders of which present only microscopic foramina, which I have observed in a series of Peruvian skulls in the museum. And sometimes behind the lamella is found a cup-like depression, of slight depth, absolutely riddled with holes. This is the most common condition (see fig. 1). Finally, at times in the dried specimen, the zone which is found behind the suprameatal spine is replaced by a large opening (fig. 2). We shall have occasion to recur to the morphologic value of these vascular orifices.

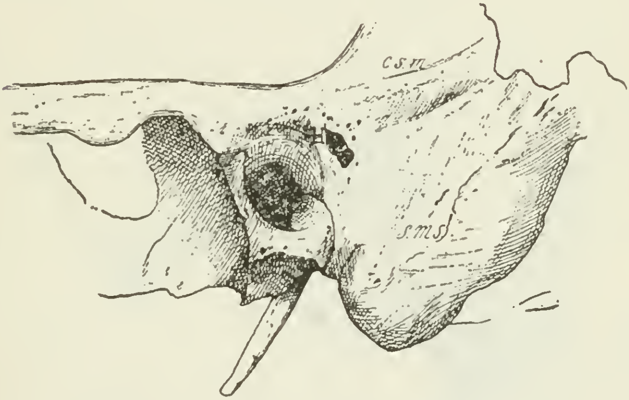
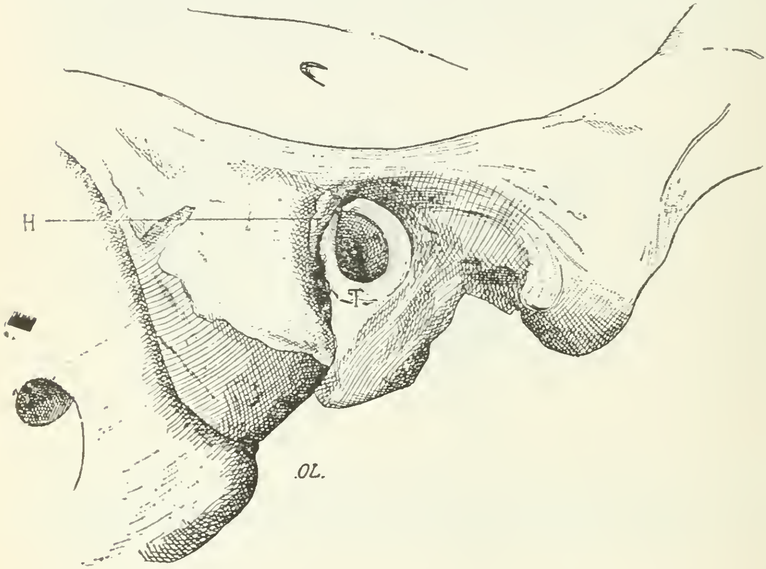


Fig. 2. A case in which there is behind Henle's spine a large foramen which leads to the petrosquamosal sinus. *sms*, mastoido-squamous suture.

Morphologic Value of Henle's Spine. What is the significance of this spine which we can not study too much, since it is the most important landmark in antrectomy? Poirier (Anat. topog., p. 224) expresses it thus: "Having studied the tympanic bone upon a hundred skulls I have often observed the lamella in continuity with the tympanic bone. Like the latter it is a secondary formation and is not found on the temporal bone of the newborn; besides it gives insertion, as the tympanic bone, to the fibrous portion of the canal. I propose to give it the name 'èpine tympanale.'" In this particular I do not share the opinion of Poirier. I have examined with this special point in view almost 200 skulls at the Anthropologic Museum, and at the museum I have examined the skulls by the score daily for several months, but never in well preserved skulls have I been able to find one in which there was continuity between the tympanic bone and the spine of Henle. Always as in figure 1, in which I have sought to reproduce the type, I have seen the posterior border of the annulus tympanicus penetrating obliquely above and within the auditory canal, separated from the suprameatal spine by an appreciable distance, often by a considerable space (fig. 2). Besides there is proof drawn from comparative anatomy which seems to be conclusive. In the adult



Adult Horse.

Fig. 3. The tympanic ring is almost completely closed: Henle's spine instead of occupying the place it does in man is a well developed osseous point not continuous with the tympanic ring.

horse, (fig. 3), the tympanic ring is almost completely closed; the two extremities of the ring are not separated by the distance of one millimeter.

However, in this animal, precisely at the spot where the spine of Henle is found in man, we see an osseous point separated perceptibly by a deep groove from the tympanic ring with which it is not joined; it is a distinct bone. We are justified in comparing this osseous point with the Henle's spine in man.

In the gorilla, the spine of Henle, which is generally plainly visible, separated from the annulus tympanicus, lies just above the circumference of the osseous canal.

In my opinion, the spine does not arise from the tympanic ring; I believe rather that it is formed at the expense of the osseous point known in embryology under the name of epitympanum (Geoffrey Saint Hilaire), the projection formed by this eminence being a factor of the importance of the vascular perforation previously mentioned, whose morphologic and operative value we shall establish later.

Pardon this digression: Henle's spine seems too little understood—it is an important landmark.

Is Henle's Spine Constant? Is it constant and can we count upon it as a landmark? When Grandhomme said that it was but slightly marked and useless, Riesselbach stated that he had found it 82 times out of a hundred and Schultze had failed to find it only 11 times in 120 temporal bones.

For my part, in 100 adult skulls in perfect state of preservation which I have summarized, I have failed to find it only a single time and this was only unilateral. 20 times (note that this includes 200 spines) it was only slightly marked, but recognizable by the eye and skilled finger. Are we not right in depending upon its existence for operative purposes?

Does Henle's Spine Exist in Children? So far we have only spoken of adults—does it exist in children?

Before deciding this, I ask my readers to examine the following table made after studying 15 skulls (30 spines) of children of different ages, which may be seen in the Museum of Anthropology. The importance of each spine is determined by the following numbers.

0 indicates no spine.
1 barely perceptible.
2 slightly marked.
3 marked.
4 well marked.
5 strongly marked.

Similar numbers are used to indicate the importance of the two landmarks, the supramastoid ridge and the mastoido-squamous suture. Their value in each child can thus be determined. Finally I have profited from these measurements, so that I can establish in these subjects the non-continuity of the suprameatal spine with the tympanic ring and the vertical distance separating the spine from the highest point of the posterior division of the annulus tympanicus.

If we assume that 2 (which corresponds to a slightly marked spine) is necessary for the purposes of a landmark, it is evident that we can hardly count upon obtaining it before the fourth year. We can not then depend upon the spine in very young children, and it can only be considered as certain in those above ten years of age.

A Special Landmark in Young Children. The study of the mastoid surface, induces the study of an anatomic peculiarity which, as will be seen, may give us valuable indications as to the manner of performing antrectomy in young children.

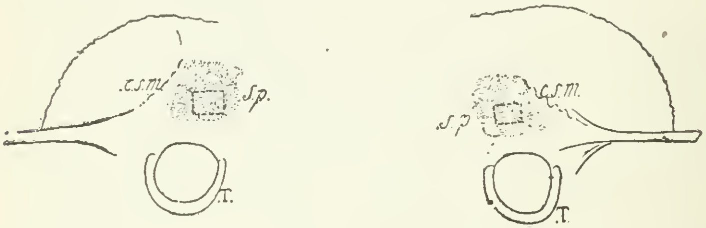
I do not believe that the special landmark which I am reporting has been studied, so permit me to expand somewhat upon this subject. I have said before that behind the spine of Henle there are certain vascular foramina more or less considerable, visible in all the crania which I have examined. In adults the orifices not only exist in the position which we have indicated but also are often prolonged above the superior wall of the osseous canal, immediately below the supramastoid ridge at the origin of the zygoma.

This may be observed by examining figures 1 and 2 which show, the first especially, the most common types.

In children, there is little or no spine of Henle. So the zone of vascular foramina is in the main reduced to the second of the two types which we have described. At least this zone is easily visible; to the eye it appears, in the pre-

No. of series.	Age.	Side.	Spine.		Supramastoid ridge.	Mastoido-squamous suture.	Vertical distance separating spine from highest point of posterior divergence of annulus.
			Volume.	Continuity with tymp.			
1	2 months	R.	1	0	1	2	
		L.	1	0	1	2	
2	1 year	R.	1	0	1	2	
		L.	1	0	1	2	
3	1 yr. 8 mos. 5 d.	R.	1	0	1	2	6
		L.	1	0	8	2	6
4	2 yrs. 8 days	R.	1	0	1	0	7
		L.	1	0	1	1	7
5	2 yrs. 1 month	R.	0	0	2	3	
		L.	0	0	2	3	
6	3 years	R.	2	0	2	2	7.5
		L.	2	0	1	1	6
7	3 years, 8 days	R.	1	0	0	0	4
		L.	1	0	0	1	5
8	4 years	R.	1	0	1	2	6
		L.	2	0	1	2	5
9	4 years	R.	3	0	1	2	7
		L.	3	0	1	2	7
10	5 years	R.	2	2	1	1	2
		L.	3	0	1	3	7
11	6 years	R.	2	0	2	2	7
		L.	2	0	1	3	7
12	8½ years	R.	1	0	2	2	6
		L.	1	0	2	1	7
13	10 years	R.	2	0	2	3	6
		L.	2	0	2	3	7
14	14 years	R.	3	0	2	1	5
		L.	3	0	2	1	5
15	15 years	R.	3	0	1	1	5
		L.	3	0	1	1	5

pared skull, as a veritable sieve with very small holes and, in the fresh cadaver of a child, as a spot resembling a sanguineous suffusion in the bone. At this point the bony tissue engorged with blood is particularly soft and friable. By a valuable coincidence—we can only call it a coincidence—in fetuses of more than eight months and in children from one to two years old, which I have examined, I have always found the antrum to correspond exactly to the before mentioned spongy spot *(tache spongieuse*, Fig. 4 and 5). Why? I do not know, and I am not ashamed to say it, but in every case it so happened. The bone in this position is so friable and the landmark is so positive that there is nothing easier than to uncover the antrum in a subject of the age indicated by scraping the bone with an old notched bistoury.



Subject No. 3. Fetus $7^1/_2$ months, right and left sides.

Figs. 4 and 5. In this subject, the position of the antrum corresponds on both sides exactly to the spongy spot, permitting penetration of the cavity at the first stroke. Note the position of the antrum above the auditory meatus.—*cms*, supra-mastoid ridge; *T*, tympanic ring; *Sp*, spongy spot.

I have repeated this observation many times with A. Broca, and his clinical experience has led him to attack the temporal in exactly the same place in making antrectomy in young children.

Later on the vascular zone corresponds to the posterior part of Henle's spine. Curious point in this connection, for it is Henle's spine which becomes the landmark. It seems that these points which serve as a guide, describe in proportion to the age, a curve from before backward and from above downward, the center of which is situated almost at the apex of the osseous canal.

We shall later see my studies have led me to describe an identical change in the position of the antrum depending upon the age.

Morphologic Value of the Spongy Spot. What is the significance of these openings? In what follows I am submitting to the reader simply a hypothesis, with the attempt to support it by facts.

In children these orifices are very numerous; in the fetus as Farabeuf and Launay have well demonstrated (Thesis, Paris, 1896) and likewise in the lower mammals "the intra-cranial blood not being able to flow through the internal jugular vein, absent or altogether insufficient, leaves the cranium through the openings in the temporal bone so as to join the parotid plexus."

These paraglenoid (post-glenoid and supra-glenoid) foramina are situated exactly in the region occupied by the vascular area. They provide communication for the blood from the lateral sinus with that of the external jugular through the medium of the petro-squamosal sinus. In the two young subjects which presented the most manifest *tache spongieuse* the petro-squamosal sinus persisted. On the other hand, in one instance (fig. 2), the foramina in the neighborhood of the spine were so large that they formed quite a cavity behind this lamella. A probe which was introduced entered, to my great astonishment, a well-developed, persistent, petro-squamosal sinus.

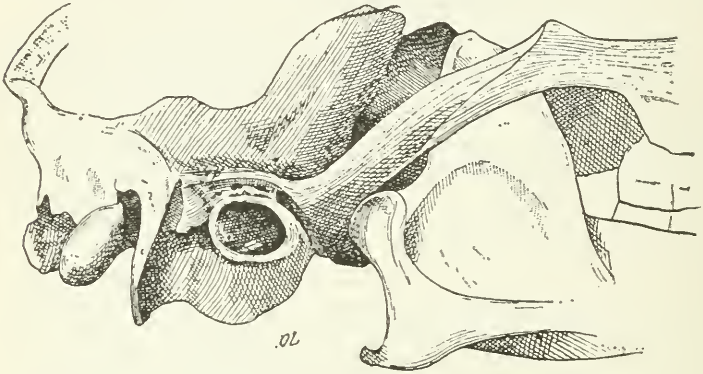
Since the existence of this vascular zone seemed connected in part at least with the passage of the intracranial blood toward the parotid plexus of the external jugular, I thought it wise to examine the conditions existing in animals with a well developed petro-squamosal sinus.

Fig. 6 represents the temporal bone of a goat. The perfectly developed petro-squamosal sinus, followed into the interior of the skull, issues, as is easy to be seen, behind the tubercle on the transverse root of the zygoma, between this organ and the anterior branch of the tympanic ring. Immediately above the ring the wall of the canal shows a series of plainly visible foramina, penetrating the external wall of the venous canal. Are we not correct in supposing that the vascular foramina in the vicinity of Henle's spine are in connection with the passageway of the venous blood from the lateral sinus toward the external jugular?

OBSTACLES.

Before entering upon the study of the structure of the the mastoid, I think that we ought to say a word about the first obstacle which the surgeon encounters in operating, the compact external table of the mastoid.

The External Table of the Process. In young children the bone is too thin to require particular attention, but in adults it is not unimportant to know the thickness of the compact tissue which we must penetrate before entering the cells. One of the few writers concerning themselves with this factor, Chipault, considers the thickness of the external table as varying from one-third to three millimeters. In my opinion the variation is much more considerable. If reference is made to my sections (figures 19, 20, 24) it will be seen that in the first two the thickness of the compact tissue is hardly one millimeter in certain places, while in figure 24 it measures not less than 6 millimeters, which it is necessary to pass through before reaching the cells.



Goat.

Fig. 6. In the goat, the petrosquamosal sinus prolonged opens between the anterior branch of the tympanic ring and the transverse root of the zygoma. The wall of the canal is perforated by orifices exactly in the zone corresponding to the vascular foramina which I have studed in man.

Such a thickness seems common enough and it will be well to remember not to mistake (as sometimes happens) a process hard to incise for a sclerosed process without cells.

THE MASTOID CELLS. We come now to the internal make-up of the mastoid process. It is important from the very first, as Poirier says, in order not to fall into error in the description of these cavities and the different types which they assume, to recognize and to separate sharply two orders or systems of very different cavities; the one, constant, almost invariable in its form, its dimensions, its situation has, as its center and principal part, the mastoid antrum; the other, very variable in its development and of multiplied types, includes the mastoid, squamous and petrous cells.

We will study the cells first and the antrum later. This order is neither logical nor anatomic; it is adopted only because it corresponds to the order of operation. Nevertheless the development of the cells is considered at the same time as that of the antrum since both are intimately connected.

The Mastoid Cells proper are of little importance compared to the group to which this name is given in surgical parlance. If we cut away the squamous and petrous cells, to which we shall return, the mastoid cells alone will remain, occupying the part of the process lying below a horizontal line which passes close to the junction of the superior third with the inferior two-thirds of the auditory canal.

The openings vary greatly in volume. Duplay, who first made known in France the differences in the nature of the mastoid process, thus expresses it: "From the researches of Hartmann, Bezold, Politzer and Zuckerkandl it appears that sometimes the pneumatic cells predominate over the spongy tissue of the bone. Sometimes the spongy tissue tends to exceed the pneumatic cells, and sometimes when these latter have almost completely disappeared, the mastoid process is almost exclusively composed of ordinary diploic tissue or, in certain cases, of a sclerosed compact tissue hard as ivory. These three varieties, in structure, of the mastoid process, have been designated by different writers as pneumatic, diploic and sclerotic mastoid."

Zuckerkandl, cited by the same author, estimates that in 100 mastoids, 36.8 are pneumatic, 43.2 half pneumatic, half diploic and 20 entirely diploic or sclerotic.

In a general way, I may state that if the temporal is considered pneumatic, the most beautiful cells will be found in the mastoid proper. It is difficult to find more perfect cells than the enormous ones shown in figures 25, 26 and 27.

Ricard, in his excellent work on the anatomy of the mastoid, makes the very proper observation that "a mastoid which is pneumatic in front may be sclerotic or diploic behind." We must expect the greatest differences in different individuals and, all the more in certain diseases, the primary structure of the process may be modified in the most unexpected manner.

Nuvoli and other writers have described in certain cases of otitis media a special sclerosis of the process.

In a case cited by Huntington Richards the process was as hard as ivory. He drilled almost four centimeters without finding the antrum. The operation continued with chisels gave no better result; the antrum could not be found; the sclerosis had completely involved the region. Although we may be somewhat skeptical as to the non-existence of the antrum, we must admit the deep sclerotic modification of the osseous structure as possible.

Can We Predetermine the Structure of the Mastoid? Is it possible to foresee the internal character of the mastoid? I do not believe so. Auscultation of the mastoid process, praised by Hugh Jones, its illumination commended in France and other countries, seem to be untrustworthy. On the other hand I do not believe that we can decide the question of the volume of the cells from that of the mastoid, as has been claimed. Small processes, such as those shown in figure 25 and 26, may contain enormous cells. And then even if we recognize the nature of the mastoid cells proper, could we draw from it any therapeutic and operative indication concerning the squamous and petrous cells, otherwise important pathologically and anatomically, and of which the cells of the first category may be considered as adnexa?

If any cells are wanting they will be those of the mastoid group. There is nothing lost, then, in not being able to judge them in advance. Let us now pass to the description of the squamous and petrous cells.

The Squamous Cells are situated in that part of the squamous which goes to form the superior portion of the external auditory canal; Ricard has well said that they could be found in front of the canal, at the root of the zygoma, above the temporo-maxillary articulation. Squamous cells of small dimensions may be seen in figures 25, 26, 27. Those in fig. 22 are large, well formed and rounded. In the main they seem small, yet one must remember them and exercise care in treatment, as shown in our figures, if it is desired that the operation be complete.

The Petrous Cells occupy the base of the process. They are limited below by a horizontal line passing through the junction of the lower two-third and the upper one-third of the osseous canal. Above they may go as far as seen (cc) in figures 22 and 23. Anteriorly they may be limited by the arched premastoid lamina (P fig. 24) which is described below. Posteriorly they are directed toward the lateral sinus, toward which they are shown extending in figures 26 and 27, and especially in figure 22 in which the lateral sinus L and the dura mater have been drawn.

If the reader refers to the horizontal sections shown in figures 19, 20, and 24, he will see how these cells are truly petrous in character as well as name.

The three sections show the relation of the petrous cells to the lateral sinus L from which they are separated by a thick bed of compact tissue as in figure 24, or by a thin lamella as in the other two sections. It can be seen from these two sections how easy it is for inflammation to extend into the sinus.

Figure 24 shows that the petrous cells (C) may be behind the antrum, along the posterior surface of the petrous which, however, pathologically and by reason of continuity, should be connected with the mastoid cells.

Concerning What is Called the "Aditus Externus." It often happens when the external table in raised, that the operator sees, a little above Henle's spine, a special cell which seems deeper than the surrounding cells. If a probe be introduced into this cavity, we may be surprised by not feeling it arrested by the cell and its entering without difficulty into the cavity of the antrum. I have observed a similar canal, evident and conspicuous about once in three times, and I propose for it the name "aditus externus." The opening is faithfully presented in figure 25 (Ad.) Happy is the surgeon who finds this; his task will be greatly simplified. I repeat, it does not always exist.

In my opinion it is only the persistence of one of the developing cells which pass from the antrum to penetrate the mastoid.

THE PETROUS ANTRUM. Finally we come to the antrum, the object of this study.

Development of the Antrum. Let us first study its development, so closely related to the mastoid cells.

If the mastoid does not exist in the fetus, and, as it were, in the new born, we find even in them a cavity called the mastoid antrum, which is prolonged behind the attic into the depth of the petrous, and which may be properly called the petrous antrum, as Poirier remarks, for it is hollowed out of the petrous.

The antrum in the fetus at full term and in the new born, is almost as large as it becomes later in adults. The air cells which ought to spread into the squamous, petrous and mastoid seem to proceed from it; they radiate from it, budding around with a mechanism quite comparable to the development of the sinuses of the face. At birth, in opposition to what has been said, some air cells are almost always present. They can easily be seen by the following procedure which I have seen Professor Farabeuf employ. A small quantity of mercury is placed into the tympanic cavity of a newly born infant's cranium and then it is turned over and shaken slightly; the metal passes from the cavity into the aditus, and from the aditus into the antrum. If the external surface of the temporal behind the tympanic ring is scraped away, the vacuoles filled will mercury will often be seen.

A fact to be noted is that the mastoido-squamous suture presents, for a time, a barrier to the growth of the cells which have not passed it in the course of the first year.

Traces of the suture are generally found later in the interior of the process in the form of a small wall bordering one or more cells, and corresponding exactly to the groove on the surface. In the case pictured in figure 26, this feature was much accentuated.

Depth of the Antrum. At what depth does the antrum lie? The question is important from the operative point of view and deserves profound study. It has not been studied in children, at least I have been unable to find an article on the subject.

In the fetus at term and in children less than one year of age which I have examined, the depth of the antrum was inconsiderable and varied from 2 to 4 millimeters to the point at which, I repeat, nothing is easier than to open it with a dull bistoury.

As the child increases in age, the antrum recedes (this inexact expression will be pardoned) irregularly, varying greatly in different individuals. In figure 15, from a child aged 3 years it had already attained a depth of 10 millimeters, while in figure 17 (child of 5 years) the depth was only 4.5 mm. In figure 18 (subject $13^1/_2$ years of age), the cavity was 11 mm. from the surface. This is already the depth found in adults. We may conclude by saying that in children the depth of the antrum seems to be in general almost in direct proportion to the age, however, it does not necessarily correspond to any exact figure for the respective years.

In adults differences are also found. We shall seek to determine their extreme limits in order to know where we should go, and how far we may go, without injuring important organs.

Writers differ singularly on this point. We read in Politzer that if after having attained a depth of 5 to 6 mm. in the direction of the antrum compact tissue is still found, we should stop. In my opinion such an otologist must often fail to reach the antrum. Noltenius seems equally timorous in concluding, after examining 22 normal petrous bones in Hartmann's collection, that trepanation of the mastoid cannot reach 20 mm. without danger of wounding an important organ, the facial or semicircular canal. I recall that Lichtenberg of Buda-Pest operated upon a man 44 years of age in whom he found no pus until he reached a depth of more than 2 centimeters. Schwartz says, "It is not necessary to go more than 2.5 cm. Chipault fixes as extreme limits 1 cm. and 2.5 cm."

As to my personal investigation, I wish to say that two subjects, No. 10 and No. 11 (figures 19 and 20), aged 45 and 25 years, had the petrous antrum situated at a depth of 16 and 15 mm. respectively, while in No. 4 and No. 5 (figure 22 and 25) the following are the figures for the two sides: No. 4, 2.5 cm. and No. 5, 2.7 cm. I am then right in saying that it may be necessary to excavate to a depth of almost 3 cm. in order to reach the antrum in adults. Of course, these exceptional cases must be handled with extreme care.

Position of the Antrum with Regard to Landmarks. I have described a certain number of varying conditions on the surface of the mastoid: the *tache spongieuse* in children; the supramastoid ridge; the mastoido-squamous suture, and Henle's spine in all subjects in general. I shall not reconsider the facilities already pointed out which give to us in very young children a friable point and a well marked coloration upon the bone; and in what follows I shall strive only to establish the topography of the antrum in regard to the landmarks studied on the mastoid surface, determining whether or not it is invariable in all ages.

First, I will say that, in the subjects of all ages which I have observed, whether fetus or adult, the antrum is constantly found below the supramastoid ridge, above and anterior to the mastoido-squamous suture which, I repeat, offers usually a decided resistance to the instrument when we seek to elevate the periosteum from the mastoid. These two points are not constant landmarks in children. They are, however, not to be disdained if they are recognizable and in adults they contribute always to the limiting of the field of operation which the following limits definitely. I have previously announced the full imporance which is presented from an operative point of view by Henle's spine, an eminence which is constant and easy to discover. Now I wish to determine the exact position of the antrum with respect to this lamella.

Inasmuch as it appears relatively late, I have taken in children, as an external landmark in this region, the apex of the ellipse formed by the bony auditory canal. It is important to consider at the same time the variations of position of the antrum in adults and in infants. Here are the results of my investigations.

In order to group these into a table striking to the eye, I have used the following notations: I designate as height (in millimeters) the vertical distance from the center of the antrum to a horizontal line passing through the apex of the curve of the osseous canal, in subjects having no spine of Henle, and through this spine in older subjects. As radius, I designate the distance between the center of the antrum and spine, or apex of canal in young subjects.

Number of Subject.	Age.	Height.			Radius.		
		Right	Left	Average	Right	Left	Average
3	Fetus 7½ months	5	6	5.5	5	6	5.5
2	Fetus 8½ months	3.5	3.5	3.5	6	7	6.5
1	At term	7	4	5.5	7	8	7.5
8	3 years	2		2	10		10
6	5 years	1		1	5		5
7	13½ years	0		0	6		6
11	25 years	0	0	0	7	7	7
4	60 years	0	0	0	7	7.1	7.05
5	75 years	0	0	0		7	7

These results may be investigated in an instructive manner from the following drawing which represents the temporal bone, inasmuch as it shows the various positions of the antrum at different ages. The distance which separates the spine from the apex of the osseous canal has been determined by a succession of calculations giving a sufficient approximation, but too intricate for me to fatigue the reader with it.

If inexact language may be permitted (for it is not the antrum which changes its position), speaking figuratively we may make the following resumé:

The antrum, situated at first, in the fetus at term, above and a little behind the roof of the osseous canal, changes its position in proportion to and in measure with the age from above downward and from before backward, descending and receding more and more from the apex of the canal. The curve described by these successive positions reaches a horizontal line, drawn through Henle's spine, about the tenth year. From this time on, the center of the antrum does not further descend but recedes horizontally backward until it attains a maximum distance of 7 millimeters in adolescence.

I do not pretend to establish a formula good for all cases —exceptions always occur—but it seems to correspond to the usual condition of things.

The Aditus. A large number of smaller cells than we have already studied open through the walls of the antrum, which represents the largest of the petrous cells.

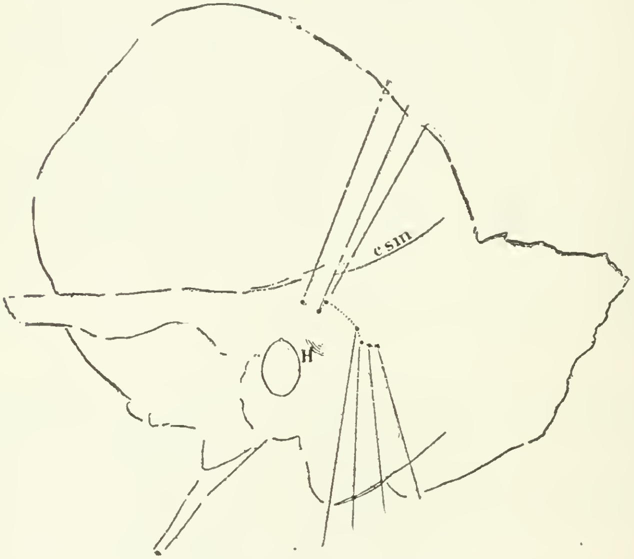
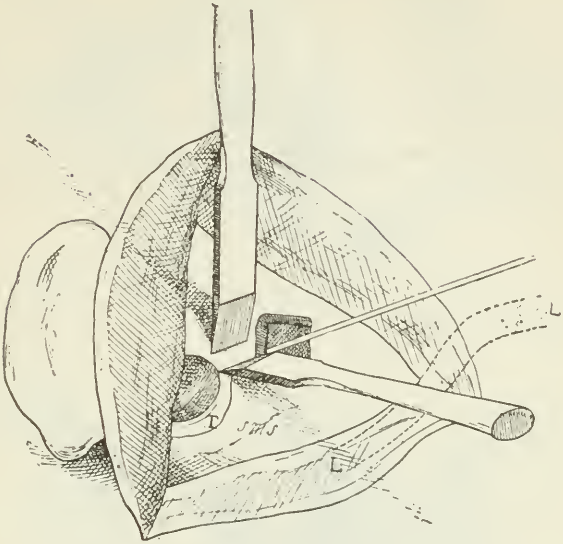


Fig. 6a. Henle's spine.

Upon the anterior wall we see the orifice of the aditus, the canal which is the communication with the supratympanic cavity, the attic. A probe introduced from the antrum into the aditus is directed obliquely from behind forward, from above downward, and from without inward (see figs. 7, 9, 10, 11, 12, 14). Note that after passing the cavity of the tympanum, the probe is engaged in the Eustachian tube, the tympanic orifice of which is found opposite to that of the aditus. This fact is well shown in figure 4.

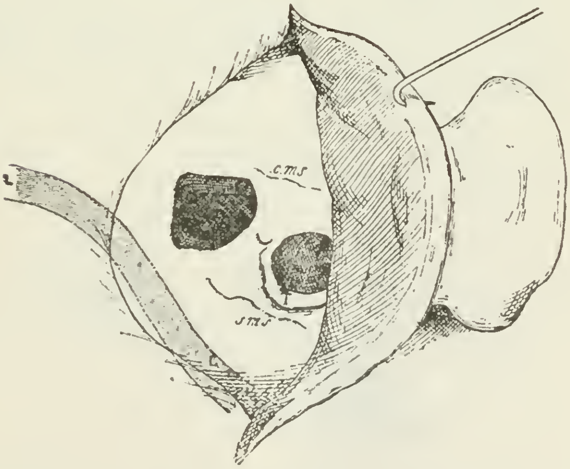
In adults the aditus is 3 to 5 mm. long, about 3 mm. in height, and 3 to 4 mm. in depth. Its roof and internal wall

Subject No. 2. Fetus 8½ Mos.



Left side.

Fig. 7. The antrum is opened: a probe is placed in the aditus which the chisels are about to enter. Notice their inclination which avoids the middle fossa and the bend of the facial.—T, tympanic ring; *cms*, mastoido squamous suture; L, lateral sinus.



Right side.

Fig. 8. Simple opening of petrous antrum.

Subject No. 1. Male child at term.

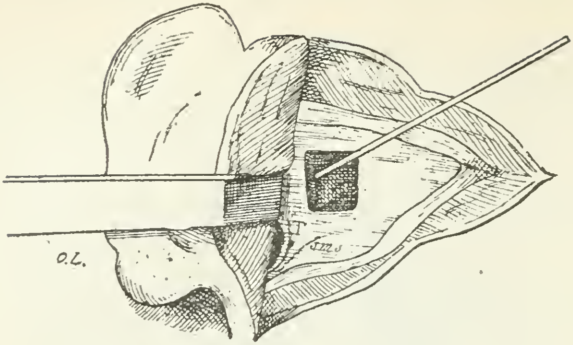


Fig. 9. Auricle drawn forward, antrum opened, probe in aditus—note the position of the antrum.

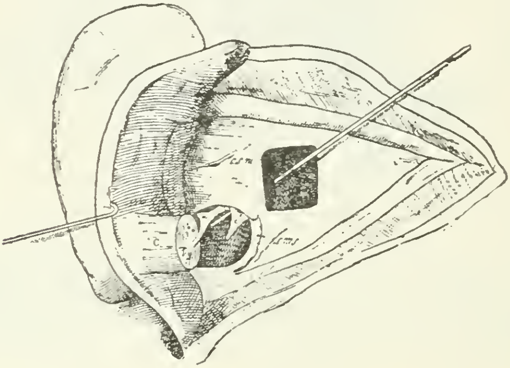
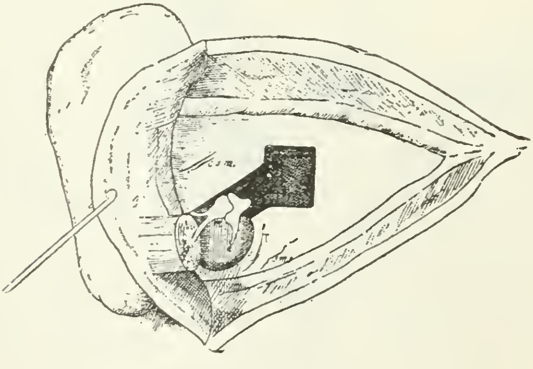


Fig. 10. Auditory canal (soft parts) drawn forward with the auricle, drawing by accident the tympanic membrane which still adheres to the hammer. The end of the probe is seen between the hammer and the anvil.



Left side.

Fig. 11. Aditus opened: short process of anvil lying there.

are formed by the cells; its floor is traversed by the horizontal portion of the aqueduct of Fallopius. On the internal wall is seen the projection of the horizontal semicircular canal. We may note that pathologically it may be obstructed by bony formations, consequently cauterization may be impossible.

THE TEGMEN TYMPANI. The roof, the top of the antrum, is formed by the tegmen tympani, a lamella often dehiscent, generally very thin, always perforated by branches of the meningeal vessels, and presenting the remains of the internal petrosquamous suture. We shall see later the operative deduction which may be drawn from these facts.

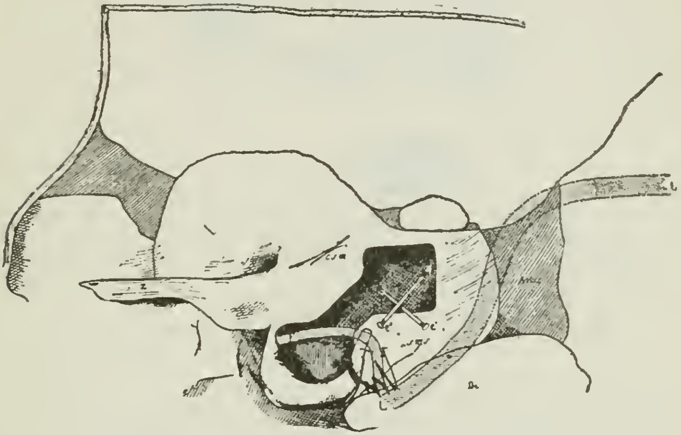


Fig. 12. It seems that there is no danger of injury to the facial or sinus. Two pins, e′ stuck into the middle fossa, e″ into the inferior fossa of the base of the cranium. Position of the sinus in relation to the asterion.

General key for the figures.

sms, mastoido squamous suture; *cms*, supra-mastoid ridge; T, tympanic ring; T*y*, tympanic membrane; *c*, auditory canal; *m*, hammer; *e*, anvil; *p*, promontory; L, lateral sinus; F, facial; Z, zygoma; P*ter*, pterion; A*ster*, asterion; P*a*, parietal; O*c*, occipital.

THE OPERATIVE DANGERS.

The position of the antrum being indicated, the passage which leads from it being determined, we should study the operative dangers encountered in opening it. These or-

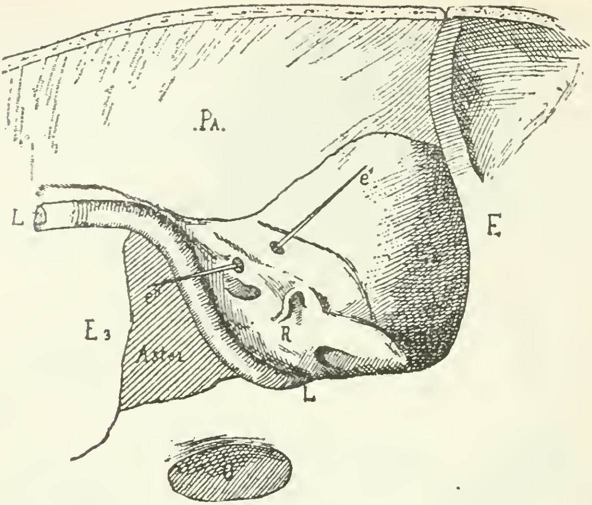
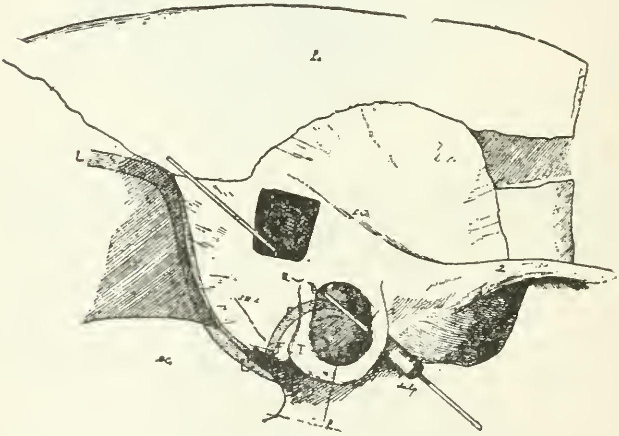


Fig. 13. Interior of the skull showing the ends of the two pins e′ e″ of Fig. 12, thrust through the antrum. Position of the sinus in relation to the asterion.



Right side.

Fig. 14. Note the position of the antrum, the facial canal and sinus. Probe is seen thrust into the aditus and engaged into the tube. Position of the sinus in relation to asterion.

gans are to be avoided — the semi-circular canal, the facial and the lateral sinus.

What then, is their exact position ?

The Semicircular Canal. The semicircular canal will not detain us. Wounding it is not of parallel consequence to that of wounding the sinus or facial nerve. We know that it is behind the internal wall of the aditus. In order to get close to it it is necessary to have uncovered the antrum; and at that moment a good protector applied upon the internal wall of the aditus will permit us to act in full security. Besides, the canal is surrounded by a solid ivory shell, the resistance of which does not in any manner resemble the friability of the mastoid cells.

THE FACIAL NERVE. This nerve, starting from the hiatus Fallopii, is directed externally parallel to the axis of the petrous for about ten millimeters. Then it is deflected, taking a vertical direction downward, leaving the skull by the stylomastoid foramen. Of these two portions, the first is already known to us, as that portion which passes through the floor or the aditus. Let us note that we may often encounter, as I have, the disposition represented in figure 21 where the facial F is, as it were, sculptured in its vertical portion up to the level of the angle which it makes with the horizontal portion. In this figure the horizontal portion is seen in a sort of tunnel, not in the floor of the aditus but much more internal.

The third portion, vertical, of the nerve canal descends in the anterior region of the mastoid behind the posterior branch of the tympanic ring, as can be seen in the figures. It traverses a lamina of compact tissue known to modern authors as the arched premastoid lamina, well described by Chipault.

The Arched Premastoid Lamina. This is what in figure 37, separates the two branches of the probe bent in the form of a hair-pin. The reader will find it in figure 24 (p). It is easy to understand the resistance which this offers to the passage of pus toward the auditory canal.

A Slightly Known Relation of the Facial. An intracranial relation of the facial which is, I believe, but little known, is that which is shown in figure 21. In its vertical portion, the facial F is separated from the jugular fossa by a band of tissue very often fragile and formed, as in the figure, of large air cells. The route of the facial being well known, what risk do we run of injuring it in antrectomy?

In children if we seek the antrum where it is found, that is o say high up, it is evident—and figures 12 and 14, where the facial F is shown, make this clear—that trepanation is absolutely without danger to the facial. Once in the antrum, if we destroy the external wall of the aditus, we run no risk of reaching the angle of the nerve lying in the floor by striking the roof with a chisel.

In adults may we injure the facial in its vertical position in making a passage toward the antrum? Evidently not if we remain parallel to the arched premastoid lamina which shows the plane of direction, as has been said above.

The chisel cuts upon the anterior part of the opening should be parallel to the auditory canal, and should be kept a certain distance from it. In the depths, may we wound the facial at the level of its angle and of its horizontal portion? Evidently we must be on our guard for a certain depth. Noltenius estimates an average of 13 mm. as the distance separating the spine from the facial. When we know the position of the antrum, sometimes very deep, the non-dangerous zone may be much more extensive. But we may defy the rule even with an aditus at 10 mm. depth. The best precaution is not to trephine too low. If we consider figures 27 and 28, we see that trepanation practiced at the height of Henle's spine and following the line Ad passes above the bend of the facial, which presents there its tympanical arrangement. In all cases, as soon as an opening in the antrum is made, it is enlarged with caution until the aditus can be catheterized. At this moment the operator is master of the situation, since he knows where the facial lies.

THE LATERAL SINUS. We come now to the study of the relations of the sinus to the antrum and to the cavity which the surgeon is obliged to make in order to enter it.

I believe that there are few surgeons who in their career have not seen the lateral sinus opened. The accident itself, we know, is not of much gravity, the hemorrhage being arrested by tamponing; but the wound covered with blood or packed with iodoform gauze does not permit of search for the antrum. On the other hand, as the antrectomy may have in view the relief of a sinus or perisinous lesion, how can this aim be properly attained if we begin by wounding the vessels? Does an anatomic condition often exist from which it may result that a surgeon opens the sinus fatally while looking for the antrum?

Hessler reports four cases of caries of the middle ear in which the sinus lay in front of the mastoid antrum (he states that he found twelve cases in literature). In these four cases the texture of the bone was spongy; the dura mater was exposed to a depth of 2 to 4 mm. and the sinus incised. In all the cases the operation had to be stopped without having reached the carious focus. In spite of this, the results were satisfactory. Hessler is truly a happy surgeon!

Pauzat found that the sinus may be wounded in thirty out of a hundred cases by "penetrating deeply into the antrum." Does this mean that once the antrum is reached there is still danger?

But here is the opinion of other anatomists and surgeons.

In 100 preparations, Hartmann did not reach the lateral sinus but twice.

Ricard in his memoir, so exact from anatomic view, states that he did not encounter this danger but once in his preparations.

This is shown in figure 15, page 114, of his memoir. But still, it seems to me that if he had met with this case in the living he would have been able by carrying the chisel posteriorly to keep within the 12 mm. which in his specimen separated the posterior wall of the canal from the sinus.

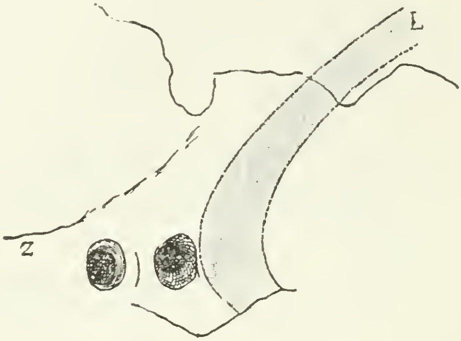
We know that Duplay reports a case of Politzer's in which the sinus was so convex anteriorly and externally that it separated the inferior from the superior part of the mastoid. In opposition to this case, I place the statistics of A. Broca—143 operations without opening the sinus.

The frequency of this operative danger has been the occasion of efforts made to determine in advance the position of the sinus. I shall not dwell upon the theory of Jones, who proposes his otoscope and a tuning fork as a means of discovering it. I pass over the less exact suggestion of Körner who thinks that the forward projection of the sinus is more marked in brachyocephalics and on the right side. Macewen traces a vertical (?) line from the parieto-squamo-mastoid reentering angle to the apex of the mastoid. The superior two-thirds of this line should correspond to the lateral sinus.

Ballance places the bend of the sinus an inch posterior and a quarter of an inch above the center of the meatus.

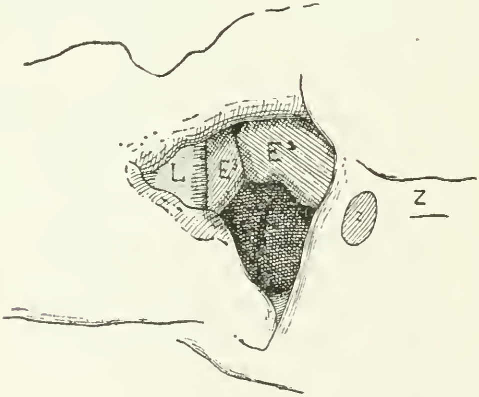
Chipault says: "The lateral sinus in its posterior or horizontal portion corresponds to the posterior third of a line uniting the inion with the retro-orbital tubercle."

Subject No. 8, boy, 3 years.



Left side.

Fig. 15. Simple uncovering of the antrum, which is 10 mm. deep. No mastoid cells proper. External table, 1.5 mm. thick; below, tissue diploic, very compact. Sinus nearest to the antrum of all subjects dissected.



Right side.

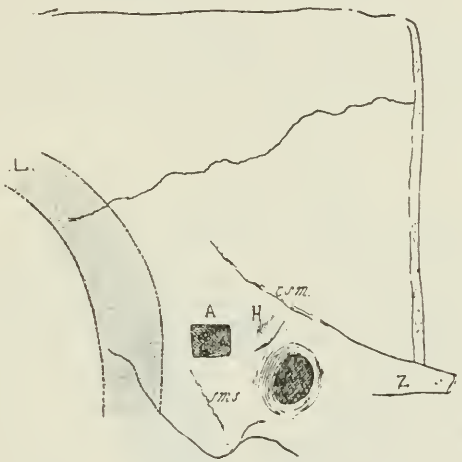
Fig. 16. Because of extensive lesions, the petrous has been completely taken away, only the apex remaining. It can be seen how easy it is to denude the lateral sinus and cerebral and cerebellar dura without injury. R, apex of petrous; L, lateral sinus: E^3, cerebellar fossa; E^2, temporo-sphenoidal fossa.

Ricard says, very properly, "The posterior half of the mastoid process is dangerous because of its vicinity to the lateral sinus, but the danger diminishes proportionately as we leave the base and approach the apex of the mastoid." Nothing is more correct; the danger is only above. This fact becomes convincing when we examine the figures in which the course of the sinus is shown.

Unfortunately it is precisely on the horizontal plane of Henle's spine that the antrum is found.

Without pretending to give the measurements, the average of which might be valueless, in estimating an element so valuable in individuals, we will examine our figures and see if we may draw any conclusions from them.

Subject No. 6, boy, 5 years.



Right side.

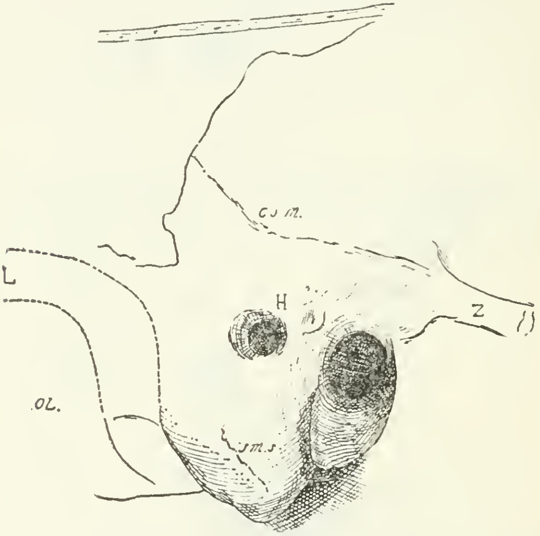
Fig. 17. Simple uncovering of the antrum, which is 4.5 mm. deep. External table 1 mm. thick. Henle's spine rudimentary. L, lateral sinus; A, antrum; H, Henle's spine; *csm*, supramastoid ridge; *sms*, mastoido-squamous suture.

In the first place, I have never found, in examining a number of crania of all ages, a case in which an adroit surgeon could not open the antrum by passing in front of the sinus without wounding it. At most, in one case, stripping of the dura mater might have been necessary. Often on inspection the sinus has appeared extraordinarily convex anteriorly, yet when it was examined its relations were found normal.

In children of an early age, as the antrum is situated relatively far anteriorly, there is little chance of wounding it. Besides it seems very common for the bend of the sinus in these subjects to correspond to the antero-superior (parieto-temporal) angle of the asterion (see fig. 13 and 14). This is a landmark useful and easy to find.

The sinus of subject No. 7 (fig. 17), in spite of a marked bend, is a considerable distance from the antrum. The same may be said of figure 18.

Subject No. 7, boy, 13½ years.



Right side.

Fig. 18. Simple uncovering of antrum, 11 mm. deep. External table 2.5 mm. thick. Henle's spine already recognizable. It can be seen how little the sinus is to be feared although its fossa is large.

Subject No. 8 (figure 15 and 16) is, of all those which I examined, the one in which the bend of the sinus was most prominent, so I have carefully measured it. The most anterior point of the sinus is still 5 mm. from the antrum. It is true that it is only 1.5 to 2 mm. from the posterior part of the opening made to enter the antrum. Finally the aditus may be catheterized by a bent probe without wounding the sinus. And in the living, by following the operative rules given later, the dura mater would at most have been laid bare.

In adults, I have never found greater difficulty than in the case of figure 26 in which the sinus is faithfully shown. Consider figures 19, 20 and 24; do they not show conclusively that we may attack the mastoid very far back without wounding the sinus, upon the condition that we begin chipping and hollowing out the posterior part of cavity in a very oblique way anteriorly and internally? And this not only in petrous bones with a deeply excavated sinus, (fig. 24) but also in those in which the sinus lies superficially on the posterior surface of the bone (fig. 20).

In my opinion, by taking the precautions indicated above, it will always be possible, except in cases which I have not seen and which seem to me to be very rare, to operate on the antrum without wounding the sinus.

OPERATIVE TECHNIQUE.

The reader will doubtless consider this chapter curtailed; he will surely find repetition.

In the preceding pages we have tried to acquire an exact notion of the landmarks in order to learn the method to follow and the obstacles to avoid. Is this not the most important part of the operation, and these three conditions established, is it necessary to go into more minute details? I repeat, what follows is only the synthesis of the knowledge acquired in the preceding chapter.

The surgeon ought to be well equipped. What instruments should be used?

Choice of Instruments—Trephine or Chisel. I have no intention of tiring the reader by giving him a useless enumeration of instruments which should be at hand before undertaking the operation which after all is only an ordinary operation of bone surgery. But at the very least something ought to be said about the particular instrument for antrectomy which goes in search of pus. What shall it be?

The trephine, after having been employed very frequently, appears to-day almost forsaken. It does not appear to me that openings can be made deep or small enough upon all points, compared to the sure and prudent stroke of the chisel, which will be effective upon the hard-est bone whether used to chip off pieces of proper thickness or held firmly in the desired direction.

But if the trephine has but few experts it is not the same with all perforating instruments.

Macewen employs a rotary drill; Green, the White's dental engine. The employment of these different instruments can evidently give rapid and excellent results in the hands of experienced operators. They do not, however, seem to offer the same guarantee as the chisel.

I repeat, it is necessary to chip away small portions so as to escape the sinus. What instrument is better for this than the chisel?

In this particular I am in accord with the majority of French surgeons. Ricard absolutely proscribes the perforator. Tillaux, Chaput and Chipault approve of the gouge, chisel and hammer. Gruening, cited by Duplay, says with reason: "What can be done with the different perforators can be done with the gouge, but what can be done with the gouge can not be done with the perforators."

We may, with stronger reason proscribe the use of a perforator such as that of Laurent. This instrument is composed of a hollow shaft bevelled at its cutting end. The shaft carries two canulae; the first, the larger, the canula of introduction, is provided with a plate which facilitates the action of the finger. The second, short, constructed with proper dimensions (a series of four is necessary) and provided with a stop-plate, is placed at the end of the first and surrounds the extremity of the shaft, leaving the cutting part free—this is the drainage canula. With the aid of this instrument Laurent makes a veritable trepanopunction. This seems to me operating in the dark.

Duplay employs two sorts of instruments, perforator and gouge or chisel. He thinks that for the surgeon who is still a novice, the use of the gouge and hammer is preferable, and that the dangers of the operation are less than with the different perforators.

It is not necessary to answer the argument of Buck (American Otological Association, July 20, 1886), who accuses the chisel of wounding healthy tissues and of causing a slower cicatrization.

I advise, then, the employment of the chisel, recommending one of slight thickness; thin chisels cut as well and make fewer fragments. The size of the cutting edge for children is 4 to 5 mm. and 1 cm. for adults. These at least are the dimensions which are most favorable.

THE CUTANEOUS INCISION. Incisions of the greatest variety have been proposed. I mention those sanctioned by the best known authors.

Politzer makes an incision in the form of an angle, with the apex directed posteriorly, whose two branches pass to the upper and lower limits of the retro-auricular groove. Treves and Macewen carry the point of the bistoury from the apex of the mastoid to the base. These incisions seem defective in the sense that they permit the use of the hook only in front of the auricle. However, Ricard has observed the utility of this procedure. Is not a part of the mastoid covered by the auricle? Is it not necessary to uncover Henle's spine? Schwartze, Hartmann and Duplay make an incision 3 to 6 cm. long, parallel to and 1 cm. behind the aurcle. Poirier follows the groove of insertion, for a length of 4 to 6 cm.

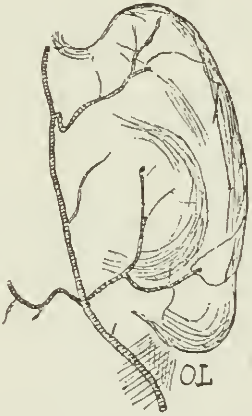


Fig. 18a. Posterior auricular artery.

After the example of Lubet-Barbon and Broca, I advise a line of operation quite close to the retro-auricular groove to a point 1 or 2 mm. from the fold, in order to facilitate suturing. The incision will pass around the superior portion of the canal toward the temporal fossa. In case of extensive disease, the incision may be carried far above and below. A. Broca afterward adds another incision perpendicular to the first. Save in exceptional cases he has given up this method.

The surface is shaved; the skin, especially that over the groove, very carefully disinfected; the auditory canal cleansed as well as possible. A stroke of the bistoury divides the skin, the subcutaneous tissue and the muscular and aponeurotic mass, from one end of the line of operation to the other.

At the time. the operator will divide the posterior auricular artery and its branches (fig. 18 a shows the arterial system of this region, in one of my preparations,) Koch's forceps are at this moment useful, but I hold that the best hemostat is a retractor. Elevation of the periosteum is also an excellent means of arresting hemorrhage.

Often in the beginning of the operation, the surgeon sees hemorrhage from the emissary vein of the posterior part of the mastoid, a venous hemorrhage generally of slight importance Chaput has obliterated the orifice with the thermocautery point.

The integument being divided, the periosteum will be elevated in front and above without difficulty. Below and behind, we know that the instrument may be arrested by a strong attachment of the periosteum. This circumstance is favorable; it indicates the mastoido-squamous suture, anterior to which we should operate. Already in the upper part of the wound the finger and the eye recognize the supramastoid ridge; below this we should work.

It is well at this stage to elevate the tissues over the posterior semicircumference of the cartilaginous auditory canal, especially above. Then the auricle draws upward and we are upon the mastoid surface—where shall we attack it?

THE POINT OF ELECTION. To be sure, in what follows, I do not refer to cases in which young children are affected. I have already described in great detail the position of the antrum in this period of life, so we thus avoid a tedious repetition. I shall only consider adults, adolescents and older children.

Before considering the point for the opening to be made, it will doubtless be instructive to relate some of the opinions which have been and are still held to-day.

J. L. Petit, whose name is linked with the history of trepanation of the mastoid, opened it at the painful spot. After him the operative indications were wanting for some time as the operation had fallen into disuse. However, in the present period, the procedures are numerous.

Richet, in his treatise on topographic anatomy, furnishes us with no precise information, doubtless because the question was not the order of the day. One of the first theses on the subject, cited by all writers who treat of the mastoid is that of Délaissement. We will not dwell upon it. The author, in effect, advises the opening of the mastoid at the nearest point possible.

Ganjot (Pauzat's monograph) performs trepanation at the level of the superior border of the auditory canal, 1.5 cm. back of the auricle.

Mitskommer uses as a landmark "the fossa which is found above the mastoid process, below the temporal line." What does he mean by that?

Parisot trephines 10 or 15 mm. behind the groove at the level of the superior border of the auditory canal. After what has been said in chapter II, this seems dangerous both to the brain and sinus.

According to Macewen, "The opening ought to be made at the posterior part of the triangle which I call the suprameatal, and which is bound by the horizontal root of the zygoma, the posterior part of the osseous auditory meatus, and a base uniting the two preceding lines."

Hartmann and Bezold perform antrectomy below the temporal line as high as the superior portion of the auditory canal, about 7 mm. behind Henle's spine. This seems proper, though the height of the incision seems rather better suited for children of ten years than for adults.

According to Duplay, we should take as the upper limit of trepanation the superior border of the auditory canal, and for the anterior limit the exact point where the mastoid plane bends forward to unite with the posterior wall of the canal. This is approximately the plan which I have adopted.

Poirier trephines on the level of the external auditory canal immediately below the supramastoid temporal ridge.

Cavoraz (Pollosson's plan) appears logical in proposing to operate 7 mm. below the temporal line and 8 mm. from the level and back of the spine. He is wrong, in my opinion, to except a case "where the pus has descended" and to advise trepanation then at the painful point. I believe that if there is pus in the mastoid, the surgeon should open the antrum with deliberate intention. The pathogenesis of mastoiditis is not contradictory to this view.

With regard to the posterior limit of the opening, we observe that Schwartze, Zuckerkandl and Ricard set the mark a little less than 1.5 cm. behind the canal.

Subject No. 11, man, 25 years.

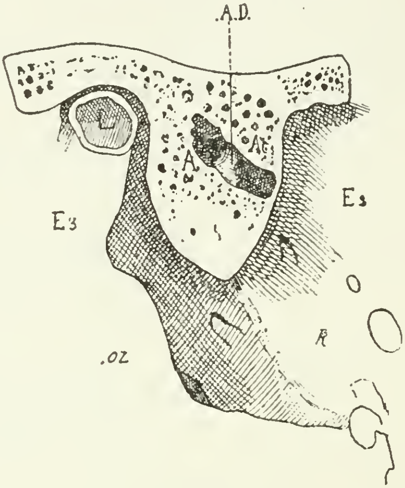


Fig. 19. Horizontal section through the antrum, aditus on the inferior wall, attic where the anvil whose short process lies in the aditus is seen. Bony canal of lateral sinus, well marked. It can be seen how one may attack the surface of mastoid quite far behind and pass into the antrum without wounding the sinus by conforming to the operative rules given. A, antrum; AD, aditus; A*t*, attic; L, lateral sinus; E_2, middle fossa; E_3, inferior fossa; R, petrous.

We have cited the opinions of anatomists and surgeons —have the mass of practitioners ignored the point of trepanation? Ask the first student you see, he will answer without hesitation, that one ought to operate in the antero-superior quadrant of the mastoid process. This is all beautiful and good, but if we consult the treatises upon the subject, we will not find an excessive clearness in the description of these famous quadrants. Thus in Chipault's most remarkable book we read. "If the mastoid process is divided into quadrants by a vertical and a horizontal line." But where does the horizontal line pass? And the vertical line? All books present in its place a direction of the mastoid corresponding almost to the squamomastoid suture. We must add that Chipault is more exact when he describes the antero-posterior quadrant in detail.

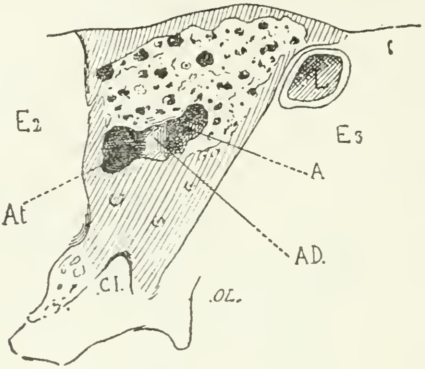
"The retromeatal surgical triangle is a smooth surface bounded by easily appreciable variations of the bony surface; behind and below is the vertico(?)-mastoid ridge or groove, obliquely below and in front and terminating above the mastoid tip often immediately below the inferior border of the osseous meatus; above is the horizontal supramastoid ridge prolonged from the superior border of the zygomatic process; anteriorly is the posterior-superior border of the bony canal with the suprameatal spine of Henle." This is almost a perfect point of election.

The formula which I give is that adopted by A. Broca. This surgeon begins by cutting a small square of 5 mm., 5 mm. behind the canal, above the horizontal line passing through Henle's spine.

These are the rules which, from my investigations, protect the surgeon from all danger. We know that in adults the center of the petrous antrum is found at most 7 mm. behind Henle's spine, and upon the horizontal line passing through this landmark. It is of little importance to enter at the exact mathematic center; it is even preferable to strike the superior portion of the antrum; the aditus will be easier to catheterize and being high up we run less chance of wounding the horizontal portion of the facial. We then make the lower plane of the opening at the level of Henle's spine or slightly below the horizontal line passing through it. Logically, since we wish this opening to be 1 cm. on each side (the ordinary size of the cutting edge of the chisel employed) we should make the anterior vertical cut 7—5 or 2 mm. behind the supra-meatal spine. But I do not make this too near the arched premastoid lamina, which is the landmark indicating the direction of the vertical portion of the facial; therefore I trace this side of the opening 5 mm. behind the spine. The top of the opening will be the length of the cutting edge above the floor, in all cases below the supra mastoid ridge. With regard to the posterior vertical cut, it is carried 5 + 10, or

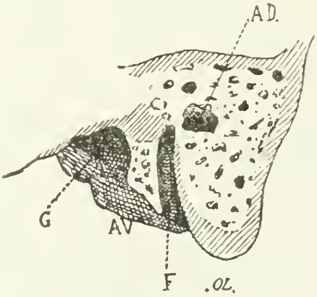
15 mm. back of the spine. In truth, if we enter deeply from this point on the surface of the bone we may sometimes touch the sinus but, I believe, this danger will be avoided if the chisel be given the proper direction while working in the depths.

Subject No. 10, 47 years.



Right side.

Fig. 20. Horizontal section. *At*, attic: AD, aditus: A, antrum; L, lateral sinus; E_2, middle fossa; E_3, inferior fossa; CI, internal auditory canal. External table 1 to 5 mm. Antrum 16 mm. in depth. Process pneumatic.



Right side.

Fig. 21. Frontal section. Posterior view of anterior section. AD, aditus; F, aqueduct of Fallopius; G, jugular fossa. The height and form of the aditus can be seen. Note that the transtympanic portion of the aqueduct is not in the floor but 1 mm. below and 3 mm. behind (frequent state of affairs). The canal F is only separated from the jugular fossa by some very thin pneumatic cells (a topographic point seldom noted). AP, vaginal process.

In adults we must trephine below the supramastoid ridge anterior to and above the mastoid-squamous suture, behind the auditory meatus.

The opening made in the external table will have the form of a square of 1 cm. to the side, the base being slightly below, also at the level of the horizontal line passing through Henle's, spine and the anterior vertical cut 5 mm. behind this eminence.

It is evident that in children according to age, the dimensions of the opening should be less. In all cases the center of the opening should be rather higher and more anterior the younger the subject, while the operator should keep within the limits established in chapter II.

THE ROUTE TOWARD THE ANTRUM. We have taken away the little square from the external table of the skull and we are in the presence of the mastoid cells. How shall we find the way to the antrum?

In the first place, let us not forget that if we find disease of the mastoid cells proper (we have explained what this expression means), it is to our interest to treat them immediately, inasmuch as this plan of action can be of assistance to us, both as to time and space. In figures 25, 26, and 27 the entire external table of the mastoid has been chiseled away before attacking the antrum. There is no danger from this and the operative field is enlarged. Let us return to the cavity made. If we have the good fortune to meet with the condition described under the name of aditus externus, nothing will be easier than to introduce the probe through the natural passageway. As already stated this is far from being constant. I shall endeavor, therefore, to establish for all cases the general direction of the passageway to be made and the direction of each of its walls.

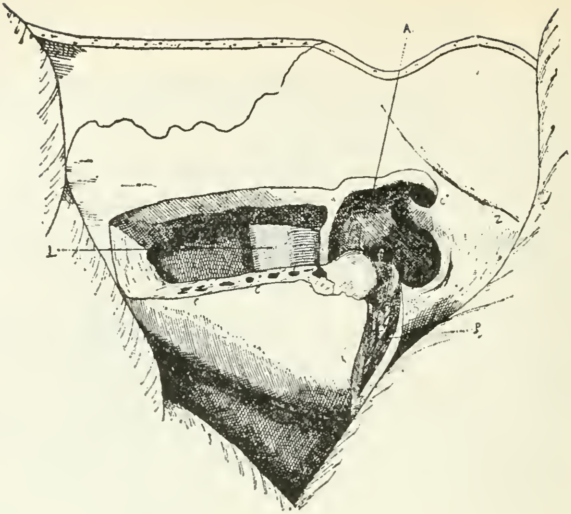
An excellent rule is that given by Farabeuf in his manual. "The operator guides his instrument along the line of the eyebrows, which indicates a plane parallel to the base of the cranium, aiming at the temporo-maxillary articulation which lies upon the pillow."

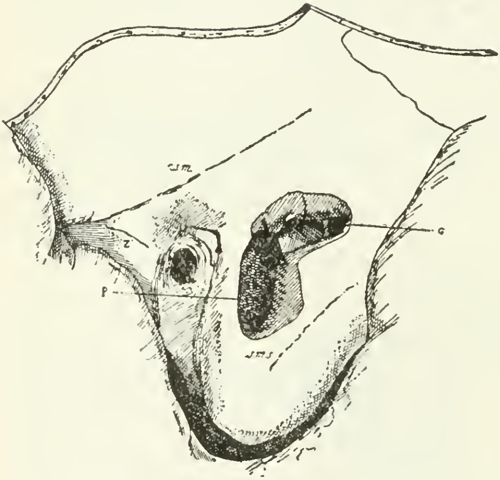
Ricard advises that the opening be directed very obliquely forward as if to reach the auditory canal. Duplay says, very properly in my opinion, that one must follow as closely as possible the direction of the posterior wall of the

Subject No. 5, man, 75 years.

Right side.

Fig. 22. Apophysis sclerosed in the mastoid portion proper. External table 4 to 5 mm. thick. Antrum 2.7 cm. deep. Numerous petrous and squamous cells. It is seen how easy it is to denude the dura mater and sinus. Atticotomy has been combined with antrectomy.



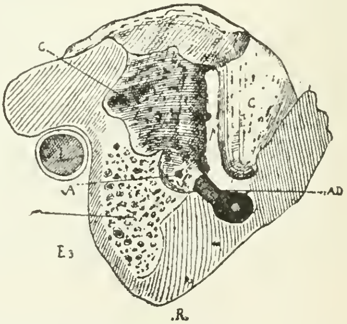


Left side.

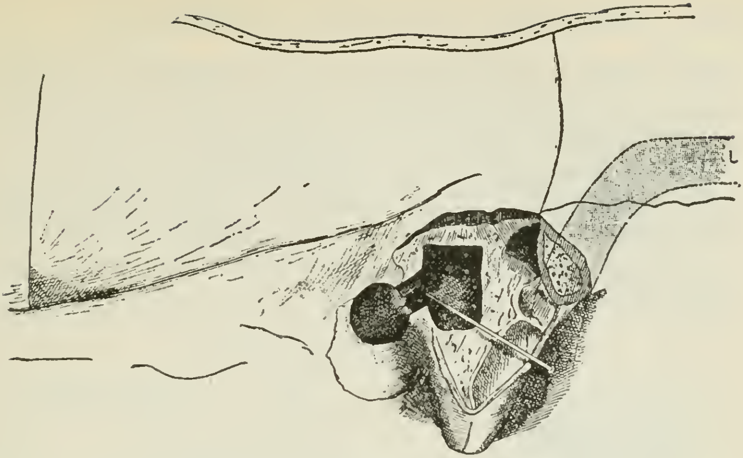
Fig. 23. Sclerosed mastoid. Antrum 2.7 cm. deep. By reason of the thickness of the external table, the mastoid cells proper were reached only by the holes P in the route to the antrum.

C. Left side horizontal section.

Fig. 24. This section passes through the antrum, aditus and attic, near the head of the malleus. Behind the premastoid lamina *p* may be seen the route traversed to reach the antrum. Because of the presence of cells back of and internal to the antrum, it is seen how easily, in this subject, inflammation might have reached the cerebellar fossa.

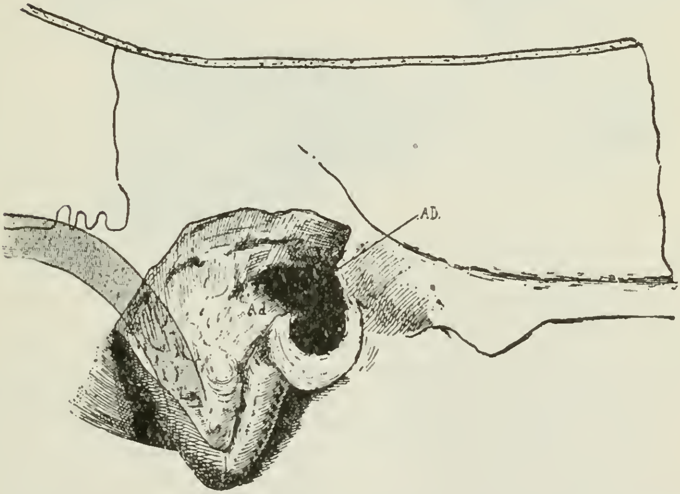


General key for the three figures above:
Z, zygoma; A, antrum; P, cells of the apex; C^1, squamous cells; C, petrous cells; L, lateral sinus; H, spine of Henle; *cms*, squamo-mastoid suture; *csm*, supra-mastoid crest; *p*, arched premastoid lamina; AD, aditus, A*t*, attic; C, auditory canal.



Left side.

ig. 26. The antrum has been opened at a depth of 2.5 cm. following the direction of the pin. The lateral sinus is 8 mm. distant from the posterior cut. The wall of the aditus is destroyed.

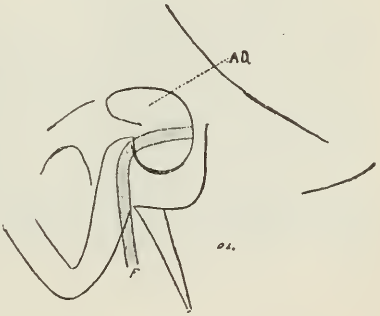


Right side.

Fig. 27. On this side atticotomy followed antrectomy. Like the other side, the apophysis is pneumatic, and the antrum is 2.5 cm. deep.

Right side.

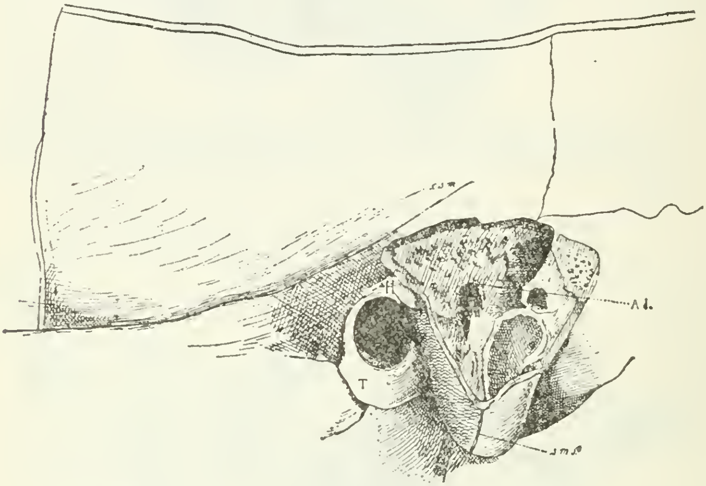
Fig. 28. Same side, facial F shown, exact size; it is seen that the facial has run no risk.



bony canal. In order to determine what direction is to be followed, A. Broca introduces a sound into the meatus, a procedure which is simple, easy and exact.

The greatest precision is observed in the landmarks outlined by Farabeuf. If the reader will refer to figures 29 and 30 which have been borrowed from this writer, it will be seen that a sharp probe thrust into the deep portion which passes down from the superior wall of the osseous canal enters the aditus. If then we introduce from time to time into the auditory canal a director which is to rest at the point indicated above, we have, any time we wish in the course of the operation, the direction to be followed as shown in figure 30.

Subject No. 4. Woman, 60 years.



Left side.

Fig. 25. The chisel having been used glancingly has, so to speak, peeled the mastoid, which is pneumatic with great bullous cells. These cells are divided into two groups by an indistinct demarcation which takes the same direction as the squamo-mastoid suture. A*d*, route to the aditus; *csm*, supramastoid suture; H, spine of Henle; T, tympanic ring; A*d*, aditus externus; L, lateral sinus; F, facial; AD, aditus ad antrum.

It is this route which the little curette should follow in obliterating the cells. However the hammer and chisel may or will be necessary. In a general way I recommend that the chisel be firmly held with the whole hand, using the cranium as a support, and that it be struck without much force, with the right elbow resting upon the body.

What should be the direction given to the chisel in working on this or that wall of the canal? Anteriorly we have taken the distances so as to save the arched premastoid lamina, and we cannot do better than to follow the general direction toward the antrum indicated above.

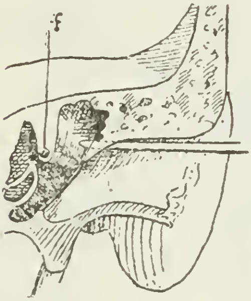


Fig. 29. Copied from Farabeuf. Attacking the antrum through the external auditory canal. The drawing shows, on the posterior part of the section, seen from in front, how the floor and roof of the external auditory canal bend downward in approaching the tympanic ring. The perforator has been pushed into the internal opening of the aditus, above the floor, in which the facial F descends. Deep in the aditus is the darkened cavity of the antrum, within the hard shell of the canal (Farabeuf).

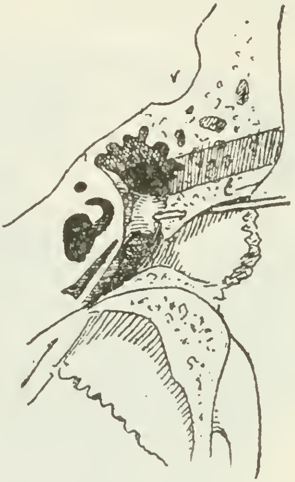
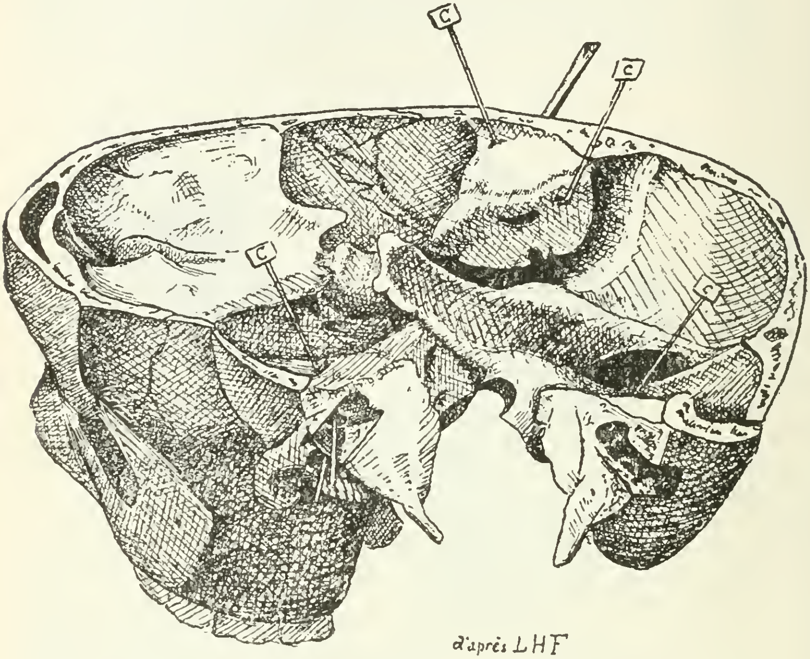


Fig. 30. Copied from Farabeuf (horizontal section). View from above, passing very near the roof of the auditory canal, the inclined portion of which has been retained in front and behind. As in the other section, the perforator is seen to reach the aditus behind which is the antrum. The opening to be made is shown: even if it were enlarged as desired the lateral sinus *r* would not be endangered (Farabeuf).

Behind we must avoid the sinus. In this region the chisel must be used with great circumspection. In order to avoid the sinus, the instrument should be directed very obliquely anteriorly and internally, as if to strike the auditory canal.

Above, the danger comes from the proximity to the middle fossa, the floor of which may be abnormally low, on account of which it will be well to direct the chisel inward and below.



d'après LHF

Fig. 31. This drawing was made from specimens and a fine plat of Prof. Faraboeuf, at which I worked. There is shown the manner of cutting the passage from the mastoid surface to the antrum. A curved probe passes from the antrum into the aditus and comes out through the external auditory canal. Penetrating probes show the manner of perforating the walls of the petrous in order to get into the cerebrum C or the cerebellum *c*.

In this subject (No. 9, about 70 years) the right side is shown; apophysis pneumatic, external tube varying from $^1/_2$ to 3 mm. Spine well marked. Antrum at 17 mm. depth at the height of the spine and 6 mm. behind it.

Below, we have taken all precautions to avoid the facial, however, for the sake of prudence the chisel should be diverted slightly upward; there will be ample time to enlarge the opening without incumbrance after the antrum is opened.

After having expressed these rules I can do no better than to refer the reader to figure 31 which shows the passageway, in extenso, to be followed in antrectomy. The last cell is broken open and the antrum has been opened without wounding any organ. However, there may be other complications of otitis media to treat besides pus in the antrum.

I shall endeavor in the following chapter to show how the work already done facilitates the surgical therapeutics of its complications.

IV.—THE FACILITY AFFORDED BY ANTRECTOMY IN THE TREATMENT OF THE COMPLICATIONS OF OTITIS MEDIA. TREATMENT OF SUPPURATION OF THE ATTIC. ATTICOTOMY COMBINED WITH ANTRECTOMY.

I will consider first the opening of the aditus and the treatment of the attic in cases where the ossicles and drum are irremediably lost. In truth, the same thing ought to be brought forward with reference to antrectomy in almost all the operations directed against old otitis; and in not adding to the preceding chapter the technique which follows, I have had the purpose of not overburdening it in view.

Denudation of the osseous auditory canal. Opening of the aditus should be preceded by enlarging the passage made and by denudation of the osseous canal. The operative technique here given is taken from Stacke's practice, perfected by Lubet-Barbon (Thesis of Weismann).

"The periosteum having been elevated as far as the auditory orifice, the postero-inferior part is freed, then the posterior, finally the superior part up to the muscular fibers of the temporal. In this way three-fourths of the osseous meatus is visible as far as the border, to which the cutaneous auditory canal and periosteum adhere. The separation of the soft parts from the hard parts is continued by introducing a fine blunt curette gently and carefully into the auditory orifice between the deep surface of the skin of the canal and the osseous canal.

The periosteo-cutaneous investment should be freed from connection with the bony canal as deeply as possible, that is to say, up to the point near the tympanic membrane where the investment is so thin that it can no longer be raised without being torn.

The membranous canal is then cut below, behind and above, as close as possible to the raised extremity, by introducing a bistoury obliquely into the depth of the osseous canal. This section opens in three directions the membranous canal, which is only adherent to the osseous canal before and below. The auricle is then drawn forward by an assistant, the membranous canal is retracted by the auricle, and the cut posterior and superior walls being removed, the anterior wall of the auditory canal is seen.

The anterior wall is severed by a stroke of the bistoury which joins the two extreme points of the preceding section; the cutaneous canal is thus cut upon its entire circumference, but it is not denuded in its anterior and inferior portion. Introducing then a fine curette along the surface of the section of the anterior wall, the soft parts are pushed away until the anterior and inferior border of the external auditory meatus is reached. Separation of the cartilaginous canal from the bony canal is then complete.

The auricle is drawn strongly forward by a retractor which holds at the same time the membranous·canal and the elevated periosteum. The operator finds the bony canal clear of the soft parts as in the skeleton."

We have now before our eyes the tympanic cavity, most often deprived of its membrane in the cases with which we are concerned. The hammer, if it is necessary, may be removed and the operator, introducing a bent protector into the cavity behind the depressed portion of the roof of the bony canal (external part of the attic) will, without danger, break the bony lamella with slight strokes of the chisel. The incus will then be easily removed.

At this time the cavity and the meatus form only a single canal and the ossicles having been detached, it is proper for the purpose of dressing to unite this cavity with that furnished by antrectomy, and to destroy the whole external wall of the aditus.

At the place where the short process of the incus is found (fig. II) a probe thrust into the aditus through the tympanum gives the direction of the canal. Replacing this probe by a bent protector and directing the chisel toward it after the manner shown in figure 7, we may, without danger to the facial which lies lower, and without danger to the semicircular canal, make a large communication between the antrectomy and atticotomy, being guarded by the protector. Nothing is easier than to remove the diseased portions and to apply the dressings until recovery takes place. (See operative result obtained, figure 27.)

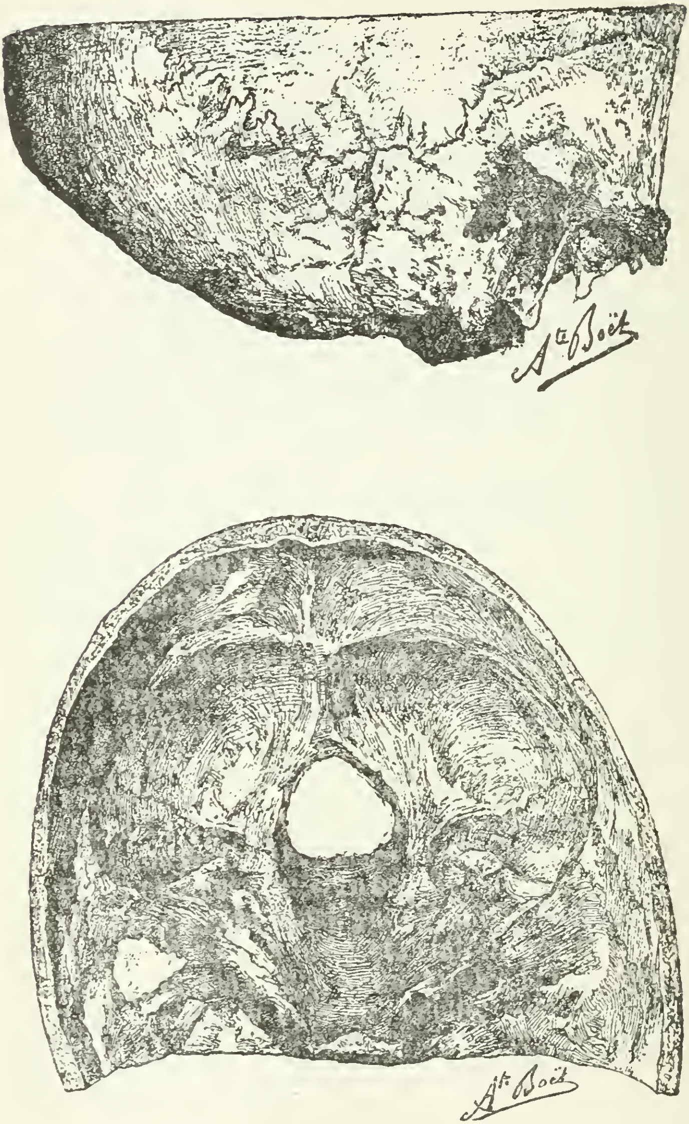
I do not dwell upon the method by which the bony cavity thus made may be epidermized. I have given in detail the method of including cleansing of the attic and of the tympanum with antrectomy, preferring in a general way the operative method which I have described to another applicable in certain cases, which consists, after opening the antrum, in catheterizing the aditus from behind forward and in immediately destroying the external wall. This second procedure seems to me more dangerous than the first.

I pass to the therapeutics of other invasions resulting from infections in the middle ear.

CLEANSING OF THE CELLS. In the course of the operation technique of simple antrectomy, I have indicated the opening of the mastoid cells proper. But pus usually invades (the operator should not forget it if he wishes to do a complete operation) the squamous and petrous cells.

Of all of my preparations, figures 25, 26, 27 and, above all, figure 23, which I invite the reader to study well, are those which make it possible to understand the method by which the surgeon should operate upon the antrum with this special point in view. It can be seen that it may be necessary to chisel large furrows on the surface of the mastoid in order to pursue the infective agent to its last retreat. Nothing is less dangerous when the antrum is uncovered, for it is not essential to go in deep. Once the external table is removed with the chisel held almost parallel to the surface of the bone, the remainder of the work may be done with the curette by small cuts and with such security that it is easy, as in figure 22, to lay bare a large surface without wounding the dura or the walls of the lateral sinus.

TREATMENT OF THE SINUS AND PERISINUS LESIONS. The technique consists in first finding the antrum, the primary source of the disease, and, starting from this point, denuding with a curette or chisel carefully handled, the



Figs. 32 and 33. These drawings show how easy it is after the antrum is opened to penetrate into the middle fossa by breaking through the tegmen tympani.

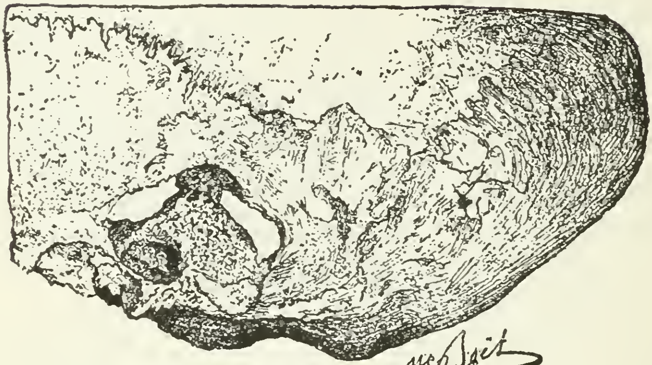
dura bordering upon the sinus. This seems the most rational and easiest method. Later I will discuss other procedures. It might be considered that when we are looking for such a large vein it is better to approach it horizontally than perpendicularly. However, I repeat, nothing is easier than to obtain the result shown in figure 22, which seems to satisify all desiderata. When the sinus is uncovered in this way, it is easy to open the purulent collection which has developed around it, or to open and cleanse it as advised and done in those modern days.

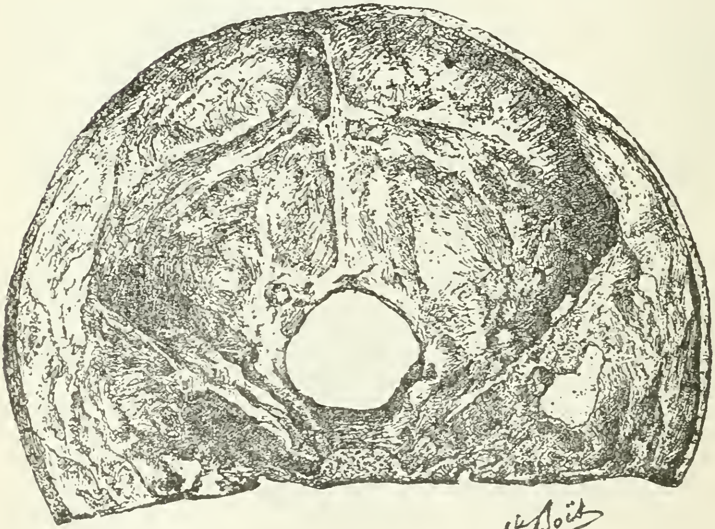
I do not wish to tarry longer upon facts which my figures show better than discussion.

TREATMENT OF CEREBRAL AND CEREBELLAR COMPLICATIONS. Finally ,does antrectomy make it possible to reach cerebral and cerebellar pus collections resulting from otitis? I shall return later to the question as to which procedure is the best; all that I can show now is that it is good and easy.

Figure 31 shows in a clear way how and by what route the probe, starting at the petrous antrum, may, following the direction imparted to it, penetrate the middle fossa C from the base of the cranium toward the brain, or the posterior fossa c toward the cerebellum. Figures 12 and 13 show with what ease in young children a simple pin properly directed may be thrust into the temporo-sphenoidal lobe C′ or into the cerebellar hemisphere c″.

Once in the antrum, in order to make a sure path toward the cerebral and cerebellar collections resulting from otitis, it will be sufficient to break open the tegmen tympani in the first instance and in the second, the wall separating the posterior wall of the antrum from the posterior endocranial surface of the petrous. We know that the tegmen is thin, offering slight resistance to the point of a grooved director. With regard to the posterior wall of the antrum one of two things happens: it is either very thin or formed of cells of slight consistence and justifying the use of the curette (figures 20 and 24). In all cases, the chisel properly handled is inoffensive in practice; and I use it in the most unfavorable conditions, namely,when there is softened bone between the antrum and the cerebral lesion. In the majority of cases, in fact, sequestra are present; the wall is friable, perhaps too much so.





Figs. 34 and 35. These drawings show how it is possible, according to operative rules laid down, after having done antrectomy, to penetrate easily into the middle or posterior fossa, toward the sphenoidal lobe or the cerebellum.

From a practical point of view, a better demonstration of these facts could not be given than by commenting on figures 32, 33, 34 and 35 borrowed from Broca. In the first two, it is seen how after antrectomy has been done the tegmen can be destroyed so as to permit exploration of the brain. In figures 34 and 35, two openings, one before and the other behind, give all facilities desirable for the treatment of cerebral and cerebellar pus collections.

V.—CRITICAL EXAMINATION OF OTHER METHODS EMPLOYED FOR OPENING THE ANTRUM AND FOR THE TREATMENT OF CERTAIN COMPLICATIONS OF OTITIS MEDIA.

Although I have designed this monograph to serve only as a commentary upon my figures, I think it useful before concluding to review some of the procedures employed to-day to reach the antrum or to treat the intracranial complications of otitis media.

Stacke's operation is much in vogue at the present time; it permits dressing of both antrum and attic. I have borrowed from this author the method by which the bony canal is divested of its soft parts and I have been inspired by his technique in making a broad communication of antrum and attic. The final result is then almost the same as in the method proposed by me, but the order is reversed. Everyone recognizes that the operator may be obliged in certain cases to approach the antrum through the aditus, in place of entering from without. Still I think that in the majority of instances the surgeon should begin with an antrectomy.

The reasons are simple enough. What does the operator do in performing a Stacke? He breaks down the wall of a canal whose entrance he sees, but whose end he does not see and whose direction he does not know. Do you not think that under these circumstances there is more danger of wounding the facial than in the other procedure where the surgeon sees the probe enter the aditus through the attic and come out through the antrum? On the other hand, the attack upon the canal seems to aim at the attic, the tympanum and ossicles as the prime purpose—this is particularly the plan of the otologist. The attack upon the mastoid such as I have described aims at the antrum and gives light upon the treatment of the cells (with which the Stacke seems little concerned) and the inspection of brain and sinus. This is particularly the plan of the surgeon.

Küster proposes to remove the posterior part of the bony canal in order to establish a communication between canal and antrum. And the facial? It is, moreover, through an analogous method that Hammond had three cases of facial paralysis in three operations.

Bergmann, on the contrary, seems to fear a nerve lesion in proposing the following technique, which is reproduced as he gives it. He opens below the temporal ridge with a straight chisel, across the strong osseous bed which lies between the roof of the meatus and the inferior and latter border of the middle fossa of the cranium, as far as the osseous border of the tympanic membrane, without opening the cranial cavity. Then he directs his chisel further behind toward the mastoid process, in order to enter from that point very obliquely into the tympanic portion forming the posterior wall of the bony canal.

Among the procedures directed against extensive caries of the mastoid process, I must mention that which is due to Chaput and called by this writer, "resection of the petrous."

This beautiful operation, cleverly conceived, seems to require an operative qualification and knowledge of anatomy which the practitioner is far from possessing ordinarily, and which in my opinion he can only acquire with difficulty, even by repeating this delicate operation many times. In my opinion it requires the attention of an expert trained for a long time in the great difficulties of bone surgery to conduct such a task. In the opinion of Chaput himself the operation is not without danger.

Practiced by an operator as experienced as its author, it has been followed by facial paralysis in three cases. In fact, in this operation the facial is constantly menaced. In the second stage of the operation (the first is the cutaneous incision), which is the resection of the superior wall of the canal and tympanum, Chaput found that there is danger to the nerve. In the third stage, the author isolates the nerve with a grooved director as far as the mastoid foramen.

I have myself detached the trunk of the facial several times in the amphitheatre—it is not easy to do. Finally, I must consider as dangerous, although very elegant and seductive, the fifth stage (resection of the inferior wall of the canal and tympanum) in which the bone being very brittle a large fragment is always detached, consisting of the entire inferior portion of the petrous, the styloid process, the vaginal process, the enclosures of the bulbus jugularis and of the carotid; sometimes at the same stroke, the spine of the sphenoid.

This procedure aims to leave only the apex of the petrous. But with my technique the same result is attained (figure 16 drawn after a specimen belonging to Broca) without incurring so much danger.

I have insisted on this fact, that the treatment of cerebral and cerebellar abscess of attic origin, by the antrum, is good and easy from the standpoint of technique; although the question of cranial trepanation in these cases has been recently treated and solved by high surgical authorities, I will be permitted to state succinctly the major reasons which seem to me to favor the adoption of the mastoid route.

Most frequently brain abscesses of otitic origin are close to a diseased petrous and on the same side.

In the greatest number of cases in fact, they are temporo-sphenoidal (especially in children) sometimes cerebellar, rarely situated outside of these common sites.

There is a considerable variety in the methods of trepanations. All promise success, which shall be chosen?

In a general way, trepanation should be performed above the ear and mastoid to explore the temporal, and in the occipital fossa to explore the cerebellum.

Where are we to operate when diagnosis is impossible, as often happens? Certain writers pretend it is always so; in all cases or in the majority of cases, psychomotor signs are absent.

If trepanation is made for the cerebrum and error results, will a second intervention be necessary?

The diagnosis is not always certain between abscess, phlebitis, meningitis and subdural abscess. Is it not evident that these last three are to be treated by antrectomy?

Cranial trepanation does not permit good drainage. Finally, since it is always necessary to look after the petrous, the source of the disease, why not commence by properly attacking the source? I do not believe that there is much value in the argument that concussion of the brain results from the strokes upon the mastoid.

I repeat, this plan already mapped out by Macewen has the sanction of good operative results in its favor.

CONCLUSIONS. My conclusions will be summaries, based on facts established by investigations and preparations which I have constantly brought to the reader's attention.

The operative technique of opening the mastoid antrum merits study which it has not received as to children, and because most authors differ as to the method of intervention in adults.

Antrectomy is an easy operation because:—

1. It is easy to establish certain landmarks and to fix a point of election.

2. It is relatively easy, in performing the operation, to avoid wounding any important organs.

It is a useful operation in that it permits the opening of the antrum and efficacious intervention in all complications of otitis media.

The mastoid route appears the best of those proposed for the surgical therapeutics of the intracranial complications of otitis.

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IX.

HYSTERICAL MUTISM IN HISTORY.*

By Raoul Leroy, M. D.,

CONSULTING PHYSICIAN TO THE INSANE ASYLUM OF EVREUX.

Translated by Albert Miller, M. D., St. Louis.

The history of hysteria, from a literary point of view, has been enriched during the last seventy years by a mass of extremely interesting material.

Calmeil, Littre, Charcot, Bourneville, Paul Richer, Gilles de la Tourette and many others have brought to light, in an admirable way, the manifestations of the great neurosis in times past. As a result of their work, the improbable maladies, the epidemics of hystero-demonopathy, the miraculous cures, which for centuries .have defied their contemporaries, appear to us as nothing more than pathologic instances of the hysterical proteus.

Among the phenomena of this character, mutism is rarely mentioned. "Considering the great number of patients, both men and women, attacked with hysteria," says Cartaz† in his excellent monograph, "it can be said that mutism is a relatively rare phenomenon. It is hardly mentioned in the old works. . . . If it were looked up in all the observations of hysterical neurosis and sought for in historic documents, certainly a much greater number of cases would be found corresponding to this clinical syndrome."

According to Landouzy,‡ Hippocrates saw hysterical mutism. "The wife of Polemachus, having an arthritic affection, felt a sudden pain in the thigh, her menses not having come on. After drinking the water from beets she was voiceless all night and until midday; she heard and understood, and indicated with her hand that the pain was in the thigh."*

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*The instances related here do not have the value of medical observations; very important details, necessary for us to know to make a retrospective diagnosis, are wanting. My sole object is to record a few interesting cases prior to the Nineteenth Century, which can be considered in all probability as hysterical syndromes.

†Cartaz, Du mutism hysterique, (Progres Medicale, 1886).

‡Landouzy, Traité de l'hystérie, 1846.

Most of the classic treatises cite the story of the son of Croesus, recounted by Herodotus. Croesus had a son endowed with the most brilliant qualities, but mute. All remedies were powerless to cure him. Now, Croesus, having been defeated by Cyrus, was about to be beheaded by one of the victorious soldiers, when his son, terrified by his father's danger, suddenly recovered his voice, crying out: "Soldier, kill not Croesus!"†

Valerius Maximus makes mention of a wrestler, named Eglis, on the isle of Samos, who was mute. Following a victory, the prize for which was unjustly refused him, he was so indignant that he burst out with bitter recrimination, to the great surprise of all who knew his infirmity. Thenceforth he continued to have the faculty of speech.‡

I have searched the works of authors of the 16th, 17th and 18th centuries for cases which might be connected with hysterical mutism. The books of the 16th century do not furnish any interesting facts upon this subject. The work of Ambroise Paré, so rich in medical curiosities, offers nothing of remark.

In the 17th century we find a limited number of important observations. One of them seems so interesting that I quote it in full. It relates to a man attacked with hysterical deaf-mutness, a very rare affection according to Gilles de la Tourette, who says: "Cases of hysterical deaf-mutism are few, since Lemoine, who was ignorant of Mendel's case, appears never to have met with it in the literature."‖

LOSS OF HEARING FOR TWO YEARS; LOSS OF SPEECH FOR FOURTEEN YEARS; SUDDEN RECOVERY.

"We cannot praise two highly the work of the Almighty as it is exemplified in the human body; for although it is subject to numerous and chronic affections, God knows how to cure them suddenly and unexpectedly, when it pleases Him. We have a striking instance in the following observation which a physician, a friend of mine, learned from his brother:

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*Hippocrates, Epidemics, Book V.

†Herodotus, Book I.

‡Valerius Maximus, Book I, Chap. VIII.

‖Gilles de la Tourette, Traité clinique et thérapeutique de l'hysterie, tome II.

"A peasant, aged 40 years, called Gilbert, became deaf and mute. As the poor fellow was no sluggard, a widow, who was slightly hard of hearing, took pity upon him and installed him in her home to work there. He liked to be busy, and scrupulously did all the work about the house.

"After two years of work and affliction, one day while digging a ditch, he heard the sound of a bell, which he made known to his comrades by tapping with his fingers. From this time on he continued to hear very well.

"Twelve years afterward, having gone out with one of his companions on April 12, 1680 (Palm Sunday), a house servant closed the door of his room, supposing that he was in and had retired. Coming in late and finding the door closed, he went to a neighboring house and lay down in a hay-mow. He was asked to awaken the domestics early Monday morning to go to market. Gilbert, lying in the granary, heard a voice, as he relates, or dreamed that he heard these words: 'Gilbert, arise and speak.' He arose and going to the door of the house where he was, knocked three times upon the door without a response. He then went to his mistress' door; the servant being awakened asked who it was. 'It is Gilbert. God has given me speech.' The girl, thinking he was some prowler, would not open the door and he was obliged to return whence he came. The woman of the house, who had arisen to go to market, heard a noise at the door, ran there, and, hearing a name which she recognized, said: 'It is you, Gilbert, and you speak.' Embracing her, he replied: 'God has given me speech, may he be praised and glorified!' The woman was so astonished that she could not talk. But, recovering from her surprise, she asked him how it was that he had recovered his voice. He related what had happened. The time for the woman's departure having arrived, Gilbert went to her husband to acquaint him with his good fortune.

"Gilbert married the servant with whom he had lived so long. He became valetudinarian, living but a short time after his marriage. He died in March, 1681.

"It is impossible to doubt the veracity of this story, since, if necessary, a hundred persons will attest its truth."*

No one will doubt the good faith of the observer, but it is not necessary to have an intervention of the deity to produce a cure, however extraordinary it may appear. The peasant Gilbert was probably attacked with hysterical deaf muteness, then muteness. Attacks of this nature may be prolonged for years without leading to any organic change. Then suddenly, one day or another, under the influence of a lively emotion, a traumatism, vexation, or some unknown cause, they disappear instantly leaving no trace. Here, the cure seems to have followed a dream, as it does sometimes. Besides the coexistence of hysterical deafness and muteness for two years, the case is remarkable for the duration of the muteness, fourteen years. The most prolonged cases of mutism cited by authors are those of Pitres, ten years, and Sédillot, twelve years.

It is curious to record the explanation which the physician of the 17th century gave for this cure.

"Cannot we attribute the reestablishment of hearing to the efforts made by Gilbert in digging? The movement which he made in working accelerated the blood and made it more fluid, and the auditory nerves were no longer obstructed. The peasant heard before he could speak because the obstruction of the auditory nerves was not so great as that of the nerves of the tongue. For this reason, the viscous matter which hindered the passages of impulses was dissolved sooner in one instance than in the other.

"That which contributed not a little to giving him speech was his joy in being with his companions, and the wine he drank added to his gaiety. His spirits became more active and more subtle. Again, perhaps he dreamed in his slumber that he was engaged in some violent act which set his impulses in action (for during sleep they are more abundant internally, since they are not dissipated by the external senses)."

Bartholin gives the history of an almost analogous case. This celebrated Danish physician relates that a citizen of Copenhagen had completely lost his voice, and could not emit a sound. Four years after the commencement of the attack, he was crossing a wooden bridge in the city, when he met an old woman whom he had detested for a long time. Filled with anger and hate, he cried out abruptly: "The devil take you!" The sound of his voice gave him keen emotion and he was greatly mortified to have commenced to use his tongue with an imprecation.*

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*Observations rares de medicine, d'anatomie et de chirurgie, translated from the Latin of M. Vander-Weil, by M. Planque, M. D., liv. II, obs. V, 1698.

"It is probable," says Bartholin, "that a clot of blood or thick phlegm had lodged at the commencement of the lingual artery and had compressed the neighboring nerves, but that the emotion of anger agitated the blood which broke up and destroyed the obstacle."

This total aphonia, cured suddenly by a violent access of anger, can only belong to hysteria. It corresponds to the classic description of Charcot: "Although the patient has wholly retained the ordinary movements of the tongue and lips, which he can move readily in all directions for breathing or whistling, as in the normal, it is impossible for him to articulate a single word, even in a low voice, in other words to whisper, and, more than that, even with the greatest attention, to imitate the movements of articulation which he sees before him. The patient is mute then in the strict acceptance of the term, in the sense that he cannot utter a word. I will add that he is more than mute; for while it is possible for the deaf-mute to emit even loud cries, the hysterical mute—mark this singular feature—is usually absolutely aphonic, so that he cannot give forth the slightest cry."†

The Ephemerides des curieux de la nature, years IX and X, 1678, and 1679, relate a case of intermittent hysterical mutism, remarkable for its systematization and duration:

"Georges Algajer, aged 25, gradually lost the faculty of speech, consequent upon heart disease followed by vomiting. Extinction of his voice was at first only temporary; later it persisted, prolonging itself day by day to an hour, three hours, eight hours, twenty-three hours, without regularity. Finally, the return of speech came at a regular time, so that for fourteen years the patient could speak for one hour only, from noon umtil one o'clock.

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*Th. Bartholin, Act. Hafnia, 1671, obs. 71.

†Oeuvres complètes of J. M. Charcot, published by Bourneville, t. III.

According to the author, it was impossible to deceive the man by changing the hands of the clock; even if this were done his attack of muteness came only at the proper time. During the time when he could use his voice, Algajer answered all questions and spoke upon all subjects with clearness and precision, and he even read in a low voice, but as soon as one o'clock arrived he could make himself understood only by signs."

This observation of intermittent muteness is analogous to the very classical one of Mendel, where the patient could speak every day from six to nine in the morning and remained mute for the rest of the day.*

L'Histoire de l'académie royal des Sciences contains a number of cases of the same sort. Here is an interesting case of 1700:

"A girl, aged twenty or twenty-two years, of good temperament, after an intermittent fever, which was stopped by the ordinary remedies, had a loss of voice which lasted without intermission for a year and a half. The customary remedies for this inconvenience gave no relief; except that when she was required to take a bath (demi-bain) she sometimes recovered her speech while in the water, but with some hoarseness. When she had this fever she was able to speak during the algid stage. M. Lemery, who had ordered several remedies for sequelæ of the fever, but not for the loss of voice, prescribed one, almost at hazard, which had an astonishing effect. This was of vulnerary herbs in the form of tea.

"As soon as she took this the first time, her voice returned for a half hour and was then again lost. But by continuing the use of the infusion, either warm or cold, she made her voice come back little by little, so that she lost it only of evenings, especially if she went out into the fresh air. Finally, even in this event, she was relieved by taking two spoonfuls of her infusion. She would hardly cease drinking when she could speak.

"It might be believed that the virtue of the infusion could only have been that of warm water, but she drank warm water several times without avail. Decoctions of herbs rich in acids, and even coffee, chocolate, salad, raw fruit, fish, thin soup, or too great an interval between meals, deprived her of speech. Meat, milk and wine did not have this effect. She always carried a bottle of her infusion to use as needed, and she said that she carried her voice in her pocket."*

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*Pitres, Lecons cliniques sur l'hystérie et l'hypnotisme, t. I.

This case of Lemery, the elder, later led his son to employ the same treatment in the following case. The result was equally excellent, and the thought is easily warranted that suggestion alone occasioned these two marvelous cures of mutism.

"A girl, aged twenty-four, after the age of seventeen was subject to loss of voice, which came on at the menstrual period and lasted two or three days, during which she used a diet-drink of couch grass and wild poppy. This moistened her chest, which she needed, but it did not restore her voice, which returned only after her menstrual period and appeared to come back of itself. A blow which broke her arm at the time of her menses, and keen chagrin at this time, stopped them and caused her to have stifling sensations and violent spells. She was cured by a great number of bleedings from the arm and foot, by emetics and various medicines, but the effect of these remedies was followed by lasting loss of voice. She could hardly make herself understood unless one brought his ear near her mouth; what little she spoke fatigued her so that she was obliged to stop. She felt a weight in the region of her stomach and she could not make the least movement without almost losing her breath. Her periods were now regular, but all her troubles were increased at these times. As for the rest she had a good appearance and appetite, and all other functions were normal.

"This condition lasted for three months in spite of every imaginable remedy. Finally, Lemery, following the example of a similar observation reported in 1700 by his father and cured by vulneraries taken in infusion, ordered it for this patient. As soon as she had taken a single cupful, her voice came back strong and vigorous as it was before her illness; there was no more oppression nor difficulty of moving, and a singular circumstance which accompanied the sudden cure was that the girl felt the weight which she had upon her stomach fall at that moment to her umbilicus, where it disappeared."*

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*Histoire de l'Academie royale des Sciences, 1700.

With the 18th century we meet with more numerous accounts. Bonet notes that a shepherd found himself mute upon awakening from a deep sleep, and that fourteen days afterward, dreaming that he was drowning and calling for help, he awoke in his distress and used his natural voice to render thanks to God.† Is not this case similar to that of Bateman:

A patient, aphasic for six days, awoke in the morning crying: "A man in the river!" He had dreamed that a man had fallen into the river, and the mental shock produced by the dream was sufficient to give him speech.‡

In a letter addressed to the Academy of Sciences,‖ the Count of Biévre vouched for his observation of the following instance:

"A female peasant in the country town Villantrois, in Berry, was accouched in the summer of 1737, but the afterbirth did not follow the child. Some days afterward, her voice failed her. Although she had not been properly delivered, her health returned and she went to work again in the household as usual, except that she kept profound silence. At the end of a month some incident occurred which suddenly made her so angry at her husband that she recovered her voice sufficiently to scold him, and, apparently, he was very repentant. From this time on she spoke as freely as before her accouchment, still carrying her afterbirth. This is very extraordinary and in more than one respect."

It appears quite probable that we have here a case of hysterical muteness occasioned by the accouchment. Although confinement is a physiologic matter, it is none the less sometimes provocative of a neurosis by reason of the great traumatism produced, as Macario has pointed out.§

I have no intention of citing here all the observations of hysterical muteness which the authors of the 18th century have left us; most of them are reproduced in contemporaneous classic treatises. I will recall, however, the typical case of Watson's, cited by Briquet: "A young woman, after an attack of convulsive hysteria, lost her voice and was absolutely mute for fourteen months. During this time she had no new convulsive attacks, and enjoyed perfect health. One evening, after being considerably heated from four hours' dancing, she recovered her voice and continued to speak thereafter."*

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*Histoire de l'Academie royale des Sciences, 1719.

†Medicin. septent. lib de Pect. affect.

‡Cartaz. Du mutisme hysterique (Progrès Mèdicale, 1886).

‖Histoire de l'Academie royale des Sciences, 1738.

§Macario. Des paralyses dynamiques et nerveuses, 1859.

The cases I have related abundantly show that hysterical mutism has been observed from the earliest times. It belonged to the 19th century to elucidate its nature and study its pathognomonic characters. Explanation is ample to-day in this respect. The fascination of marvels is, however, so great that our contemporaries of the 20th century still became ecstatic over the "miracle story" which filled the English journals in April, 1901.

"It relates to a French sailor, named Jean Mafurlin, who fourteen years ago, fell from a mast in Portsmouth harbor and remained under the water some ten minutes. When he was brought to the surface, half dead, the unfortunate man had completely lost the use of his voice. He was cared for, and a Barking gardner took him into his employ.

"It is to be noted that Mafurlin, at the time of his mishap, knew only a few words of English, but freely spoke French, Italian and Portuguese.

"When the unfortunate man had been in the gardener's service for fourteen years, during which time he was mute, he sustained a severe shock one day by the sudden discharge of a cannon near him. The shock almost instantly restored his voice, and Jean Mafurlin began to speak English, French, Italian and Portuguese. English is now even more familiar to him than the other languages, which he has partly forgotten."

This case, which amused the chroniclers of both worlds, is not difficult to explain. Jean Mafurlin had been attacked with hysterical muteness following a violent emotion; another violent emotion cured him. Such a thing need not surprise us. It is the nature of hysterical affections to come on and to disappear with equal suddenness. "Hysterical attacks," says Pitres, "may be suddenly provoked, modified, or suppressed by psychic influences or physical causes, which have no effect upon similar attacks depending upon organic lesions. . . . . . Hysteria is the great provider of unexpected and extraordinary cures. Even in cases which appear most obstinate, a lively moral emotion, fright, anger, vexation, chagrin or joy may quickly induce a cure.

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*Watson. Philosoph. trans., vol. XIV.

In regard to the case of Jean Mafurlin, occurring in the twentieth century, it is no doubt unnecessary to recall that of Gilbert in the seventeenth century; they may be regarded as parallel. It is more interesting for the thinker to compare the interpretations of the same thing, set forth with an interval of more than two centuries between.

ABSTRACTS FROM CURRENT OTOLOGIC, RHINOLOGIC AND LARYNGOLOGIC LITERATURE.

I.—EAR.

Otitic Brain Abscess.

PAUL MANASSE. (*Zeitschrift für Ohrenheilkunde*, Bd. 38.) The patient, aet. 33 years, suffered from otitis media acuta for five weeks. The operator intended to do a single Schwartze operation; however, upon elevating the periosteum he found a fistula with pus welling up into it, situated above and behind the auditory canal. The edge of the fistula was chiseled away and friable bone filled with pus and granulations removed. The fistula led directly to the dura which was covered with pus and discolored, and which showed an irregular opening one centimeter long running to a cavity within the temporal lobe. In this was found a yellowish-red mass of brain substance mixed with pus. Recovery was uneventful.

A second case was a man 24 years of age who suffered from middle ear suppuration for some years. For four days he had severe headaches and later weakness in the left arm and leg, the objective signs showing polypi and white cholesteatomatous masses in the auditory canal. The diagnosis made was cholesteatoma of the middle ear and abscess of the right temporal lobe. The antrum was filled with cholesteatomatous masses and pus. The typical radical operation was made and the tegmen antri and tympani was chiselled away. The dura was covered with granulations in one small place over the antrum and greenish-brown foul-smelling pus found. The abscess was about the size of a hen's egg, with numerous pockets. One of these pockets, during the after-treatment, became subjected to pus retention which manifested itself by headache and great weakness in the left arm. After relieving this by introducing the fingers, recovery was uneventful.

Levy.

Arrhythmic Pulsation in a Cicatrix of the Drum Membrane.

GROSSMANN (*Berliner Otolog. Gesellschaft*, May 14, 1901.) exhibited a case in which there was struma on the same side and likewise valvular insufficiency. *Levy.*

Sequestrum of the Ear.

GROSSMANN (*Berliner Otolog. Gesellsch*, May 14, 1901) demonstrated a case caused by acute middle ear suppuration. He found necrosis six times in one hundred cases of acute suppuration. Discussion of this case showed that dizziness seldom occurs in children. *Levy.*

The Present Position of Otogenous Pyemia.

JANSEN (*Deutscher Otolog. Gesellsch.*, May 24-25, 1900) states that the following are to be distinguished: 1, obstructive septic disintegrated thrombosis; 2, thrombosis along the wall; 3, compression thrombosis. The dura offers a much stronger resistance to the suppurative process than the thinner sinus wall. The thrombus along the vessel wall may be relieved if the external portion is removed. In a solid thrombus, cure may follow an early disappearance of the exciting cause. Compression thrombosis is no contraindication to operation. Bulbus-thrombosis is especially liable to occur in acute middle ear suppuration, and following this pyemia. We do not find the so-called osteophlebitic pyemia (Körner) resulting from the veins of the bones but in its place we find pyemic sinus-thrombosis. In infants alone is it possible for pyemia to result from the entrance of toxins. He observed metastases in joints and muscles in ten cases of sinus thrombosis which were all typical. It is generally admitted that the septic thrombus should be removed. Mild cases of pyemia may be cured by laying the sinus free. Opening the sinus and ligature of the jugular, according to the literature of the subject, gives better results than where the former alone is done. According to Jansen, the operation is indicated in all cases of sepsis or severe pyemia with serious general symptoms and pulmonary metastases, otherwise only when the infected fluid of the sinus extends to the bulbus. In thrombosis along the wall, the general symptoms are well defined.

Brieger stated that otogenous pyemia has no simple genesis. There are cases in which normal anatomic relations are found in all the venous plexus of the ear. There are also pure bacterial emboli.

Streptococci are the usual cause of the suppuration. The diagnosis of otogenous pyemia can only be established by the characteristic temperature curve; how ever, there are cases in which the fever is either atypical or absent. Cure has even followed marked meningitis, metastatic lung abscesses and severe poisoning. In the discussion, Körner agreed that osteophlebitic pyemia was less common than formerly supposed, but the possibility of its occurrence must be established by future observation.

Jansen remarks in conclusion that an absolutely lethal prognosis need not be given when lumbar puncture gives a positive result. *Levy.*

Nasal Obstruction and Ear Disease.

A. C. BARDES, New York. (*Medical Record*, Nov. 16, 1901.) A review of the nasal conditions, both of development and of disease, which tend to cause disease of the ear, such as adenoids, large tonsils, nasal catarrh and nasal obstruction. The relation of the exanthemata and other infectious diseases to diseases of the ear and the treatment is considered. One of the first things to be done in connection with any ear trouble is to get the nose and throat into a healthy state. Internal medication is often desirable as an adjunct to local treatment.

Richards.

A Case of Bilateral Labyrinth Necrosis with Bilateral Facial and Auditory Paralysis.

HERZFIELD. (*Berliner Klin. Woch.*, 1901, No. 35.) A boy of nine and a half years of age, had pain in both ears and swelling of the mastoid, three days after the appearance of an attack of scarlet fever and pharyngitis. At the same time or a day later, he was affected with bilateral facial paralysis and deafness. There was no vertigo or vomiting. Operation was performed on the left side six weeks later. The entire mastoid was necrosed and the horizontal semi-circular canal abraded. The limits of the necrosis of the labyrinth were not marked off at the time. Fourteen days later a sequestrum which included the larger portion of the semi-circular canals was removed. In the right ear there were sequestrum of the mastoid and caries of the Fallopian canal and horizontal semi-circular canal. Recovery uneventful. Paralysis of the facial and auditory nerves unchanged. The eye conditions are worthy of note. Voluntary or reflex closure of lids impossible, but both eyes are closed in sleep. By way of explanation the writer presents two points: (1) in sleep there is a cessation of the tone of the smooth muscular fibres, supplied by the sympathetic, which lie in both lids, and which cause the widening of the palpebral fissure; (2) the bulb is drawn back into the orbit by the four recti. When the patient is awake, they act through the agency of the same smooth muscular fibres of Tenon's capsule which are innervated by the sympathetic. On this account they act properly in sleep. *Levy.*

Bilateral Malformation of the Hearing Apparatus.

KAUFMANN, (*Zeitschr. für Ohren.*, Bd. 39) had the opportunity of investigating anatomically four malformations in two individuals. They exhibited the same sort of arrest of development in different grades. Only one auricle was substantially normal, the three others being atrophied and appearing as superficial cutaneous flaps, containing cartilage particles. The auditory canal was represented by a small groove in the bone, the middle ear being enclosed by solid bone. Hammer and anvil in two preparations were the subject of bony union, and were adherent to the lateral wall of the atticus. The stapes, smaller than normal, was imbedded in a pseudo-membrane, which stretched across the entire tympanic cavity. Antrum was absent and the tube normal. Labyrinth normal in all preparations. *Levy.*

The Advisability of Early Operative Intervention in Acute Mastoditis.

EDWARD BRADFORD DENCH. (*New York Med. Journal*, Oct. 19, 1901.) Dench gives the report of a case of acute suppurative middle-ear inflammation, with the mastoid tenderness and other indistinct symptoms referable to the mastoid. The acute process subsided, and some few months later a swelling appeared over the mastoid process. This swelling was incised, a profuse flow of pus following. Upon probing it was ascertained that cortical perforation of the mastoid bone had taken place. The mastoid cells were completely filled with a mass of granulated tissue. The trabeculae between the cells were carious, and the entire mastoid process was converted into one large cell. The writer assumes the radical stand that in cases of mastoid inflammation sufficiently severe to cause pronounced tenderness, with a fluctuating post-aural swelling, expectancy must not be employed, but operative intervention is invariably indicated. The editor is in thorough accord with the views of the writer, as the opening of the mastoid under aseptic precautions is absolutely devoid of danger, and the delay in a doubtful case is apt to lead to serious and dangerous complications.

Seymour Oppenheimer.

The Mastoid Operation in the Constitutional Diseases.

BARTH *(Zeitschrift für Ohrenheilk.*, Bd. 38) gives a very valuable exposition upon the question whether or not serious surgical operations should be undertaken in diabetics. His case was one of acute otitis media in a 64 year old man, who had suffered from diabetes (sugar 4 per cent.)for a year. Under appropriate diet, the sugar had been reduced to 2 per cent. After five weeks the writer decided that as the pain behind the ear continued and the secretion remained unusually copious, a mastoid operation should be performed. By reason of the fact that another aurist advised delay, the operation was postponed. In the course of the next week, a decided change for the worse took place and a sequestrum was discovered upon the posterior wall. Pain increased and considerable swelling upon and under the mastoid appeared. Upon operation the cortex was found friable and discolored, the posterior superior wall being entirely sequestered. The cure was not influenced by the increased pain. It is also interesting to note that by this time the antidiabetic diet had caused a disappearance of the sugar. In another case there was an acute otitis media in an old man requiring an operation after a few days. Chilly sensations and severe headaches appeared two days after, indicating upon examination a typical attack of gout, the wound itself and its vicinity being reddened and inflamed. The changes disappeared with discontinuance of the gouty attack which was localized in the great toe, wherefrom the writer believes that the infiltration in the vicinity of the wound was likewise gouty.

In the third case, a patient with pulmonary tuberculosis became affected with tuberculosis of the ear and temporal bone. The disease in the ear appeared as an acute otitis media, entirely painless. The continuance of the fever indicated operation. Tubercle bacilli in the antrum pus. During the after treatment it became necessary to close up two fistulae. Hearing regained in four weeks, after incision of a peritonsillar abscess. When the patient recovered he could hear whispered voice at five meters. In five months, under appropriate treatment, the lung affection was cured. *Levy.*

The Clinical and Pathologico-Anatomic Relations of the Ear in True Diphtheria.

LEON LEROIN *(Archiv. für Ohrenheilk.*, Bd. 52) believes that he is the first to undertake the extensive study of diphtheria in connection with the ear from the anatomic, clinical and bacteriologic standpoint. In all, there were sixty cases, bacteriologically examined; in fifty there were pathologic changes in the ear, in thirty-eight of which they were caused by the predominant disease. He distinguishes three groups, those with evident symptoms of otitis media, those with slight changes and those with tubal and tympanic catarrh.

The symptom-complex shows itself in the signs of a serous exudate, retraction, dimness and diffuse redness of the drum membrane. These remain constant from the beginning of the attack and throughout its whole course. Subjective symptoms are generally not present. Paracentesis was performed but once; spontaneous rupture did not occur in any instance. Hearing was generally moderately diminished. The ear affection, in the main, was present in the early cases, occurring, perhaps, coincident or previous to the pharyngeal symptoms. Small children were especially affected. It was impossible to demonstrate any relation between the frequency and intensity of the ear symptoms and the intensity and extensiveness of the pharyngeal symptoms; however, it was possible to do so in regard to the severity of the general and ear manifestions. In one case, diphtheria of the auricle and the external ear was demonstrated bacteriologically, in which the pharynx had been free from the beginning. The writer believes this case to have been one of primary diphtheria of the middle ear. Diphtheria of the posterior surface of the auricle was found in several cases. In the majority of the cases the slow course of the otitis media was striking, and even in the later stages was not accompanied by graver symptoms.

Specific diphtheritic otitis media occurred very seldom, being associated with severe general symptoms. The anatomic observation included twenty temporal bones. The middle ear was found entirely normal, one time; free from secretion twice; filled with serous exudate seven times; pure tenacious pus eleven times. The changes in the mucous membrane of the latter cases was of a much higher grade; in three, partial necrosis was present, in one case sequestrum in the antrum. The changes in the tube were most marked near the pharynx. Diphtheria bacilli were in no case found.

The Symptomatology of Hysterical Hypesthesia Acustica.

HAMMERSCHLAG. (*Monatschr. f. Ohrenheil.* Bd. XXXV) states that complete hysterical deafness occurs less frequently than reduction in hearing. In addition, it is to be observed that in complete deafness of one side, the hearing is diminished on the other. In these cases retention of sensibility and faradic excitability are proportionate. The characteristic hysterical deafness presents a striking incongruity in the diminished hearing acuity for speech and tuning fork on one side, and tuning fork and watch on the other, both by air and bone conduction. Bone perception for the tuning fork is greatly diminished while the watch is heard, through bone conduction, although it is a source of weaker sounds. Occasionally a considerable shortening of the tuning-fork perception through air conduction is observed, although whispering may still be heard at 6 meters. The writer considers that these symptoms show a slight abnormal fatigue of the auditory nerves for continuous sound excitation diminishing in intensity. This may be demonstrated in the following way: A tuning fork of medium pitch is held before the ear until the patient states that he does not hear it any longer. It is then taken away, and after two seconds it is held again near the ear; the patient now hears it again. This observation may be repeated a third time. The correctness of the diagnosis is shown by a series of cases which were subjected to suggestion-therapy.

Levy.

Blue Coloration of the Drum Membrane, and the Occurrence of Varices Upon the Drum Membrane.

T. ROHRER (*Zeitschrift für Ohrenheilk*, Bd. 39.) There are drum membranes which are light blue, blueish-gray or greenish blue in color, or in which the color is confined to certain portions. A blue or violet color is often found over the tendon, resulting from a considerable deeping of the floor of the tympanic cavity, or from a deep position of the whole annulus and a projection of the bony canal. Similar spots are sometimes found in the neighborhood of the ostium tympanicum.

A blue color is sometimes seen in the lower part or over the whole of the drum membrane when a dark or blood-colored exudate is present. Of special importance is the blue color of the tympanic cavity, seen when the bulbus jugularis lies high, and dehiscence of the bony wall is present. Several cases of serious hemorrhage after paracentesis exhibited upon later examination a blue shadow at the bottom of the tympanic cavity, demonstrating that the blood came from the jugular.

The writer details an exceptionally uncommon case of blue coloration of the drum. A seven-year-old boy came under his observation for an obscure affection. The entire left drum was of a diffuse dark blue color. In the posterior superior quadrant on the right side, there was a prominent bluish-red tumor, of the size of a grain of pepper, which was recognized as a varix. In the course of seven years of observation numerous changes took place in both drum membranes. The diffuse blue color disappeared and then returned, the varix shriveled up, a cicatrix appearing in its place, then new varices large in size appeared. Hearing on both sides was five meters for whisper. *Levy.*

Otitic Diseases of the Brain, Meninges, and of the Blood Vessels.

WITTE AND STURM. (*Zeitschrift für Ohrenheilk.* Bd. 38,) report twelve cases of intracranial affection treated by operation, which should be read in the original. *Levy.*

Therapeutic Value of Vibration-Massage of the Drum.

SCHWABACH (*Zeitschrift für Ohrenheilk,* Bd. 39,) has used Breitung's apparatus in 173 cases, 70 with unilateral and 103 with bilateral affections of the ear, a total of 276 ears. It was used daily, at first with slight rapidity, viz: 600 vibrations with a stroke of 2 mm. If no vertigo or other symptoms resulted, the rapidity was gradually increased up to 1,200 vibrations, while the stroke never exceeded 5 mm. Under these conditions the writer did not observe any unpleasant symptoms, as fainting, severe pain, vomiting. If vertigo occurred often, treatment was discontinued. He does not consider it necessary to completely close the auditory canal by a rubber ring. Great sensitiveness was not observed. The sittings lasted from one to two minutes and treatment was discontinued if no improvement was noted after one week. Treatment was only continued in such cases which showed substantial improvement. The results which are discussed are those in cases treated for two months to two years. At first he used the apparatus in middle-ear sclerosis, that is that form in which deafness and tinnitus with few objective symptoms were present, and in which an increased duration of perception of deeper tone by bone conduction and negative Rinne existed; 43 cases with 81 affected ears. Improvement of hearing resulted in only 4 cases; improvement in subjective noises, 19 out of 68. In simple chronic middle-ear catarrh, especially in the hypertrophic form, favorable results followed; 18 out of 46 with lasting improvement of hearing, and 16 out of 35 with improved subjective noises. In two cases in which massage alone caused slight improvement, the treatment was combined with Eustachian dilatation. Decided improvement occurred in one of these. Most of the cases had already been treated by the usual methods without result; 16 out of 27 cases of sabacute middle-ear catarrh were improved. Still more successful were the cases which resulted from acute otitis media, from influenza, frequently causing in the course of the inflammation intense subjective noises. Out of 12 cases, in 6 was the hearing relatively improved, likewise the subjective noises in 6. The results were especially good in cases where there was a residuum of chronic middle-ear suppuration—22 out of 24 cured of subjective noises, and hearing was improved in 22. The writer considered from these results that vibration and massage is worthy of note as a remedy for the treatment of certain forms of middle-ear disease in which it has hitherto not been used. In middle-ear sclerosis it is of but slight benefit. *Levy.*

A Symptom of Hemoglobinuria; Cyanosis and Gangrene of the External Ear.

ROHRER saw a patient whose auricles were blue for six weeks after severe bodily exertion and exposure. The ears looked as if they were frozen. The urine contained albumin and hemoglobin. The hemoglobinuria was relieved; on the border of left helix a superficial gangrene appeared. Both affections were relieved in three months.

Levy.

The After Treatment of the Radical Mastoid Operation Without Tamponade.

A. V. ZUR MUHLEN (*Zeitschrift für Ohrenheilk.*, Bd. 39) has for some years modified the after treatment of these cases by leaving off the tampon after the first or second dressing. From his experience, he believes that the plan may be recommended in general, in the first place because of the painfulness of the tampon procedure, and secondly because the after treatment is shortened. At the operation, he takes away only so much of the healthy bone as is necessary to bring the disease completely into view. In all cases he sews up the wound primarily. The first dressing is left six days, the second, three. Then the tampon is left out and he removes the discharge by regularly syringing the ear. In fetid cases he adds a ten per cent. naphtholin solution. Granulation under this method is livelier than usual. Still, smooth epidermization usually occurs. It is seldom necessary to use a sharp spoon. The opening which remains is generally smaller than is usual. When there is an inclination to the formation of membrane between single sections of the cavity, the tampon of course must be used. Luxuriant gramulations are only found when diseased bone is present. *Levy.*

Pathologic Anatomy of the Inner Ear and Auditory Nerves.

PAUL MANASSE (*Zeitschrift für Ohrenheil.*, Bd. 39) discusses the pathologic anatomy of the inner ear in two cases without previous clinical examination. The first, was a man, aet. 43, who died of pulmonary tuberculosis. External and middle ear and labyrinth were normal. The auditory nerves, however, upon being treated with the usual stains, showed a large number of light spots enclosed between the longitudinal fibres, some round, some long. Under high power, it was found that they were composed of a fine network with amylaceous bodies contained within them. There was no connection with the nervous substance. The writer considers the affection as a grey degeneration, such as is usually found in multiple sclerosis, tabes, etc. It is remarkable, however, that other signs of degeneration are absent from the nervous system.

The other case was a syphilitic, aged 35 years, who died suddenly, after being deaf for many years. On autopsy, extensive specific changes of the cerebral arteries were found, also an aneurysm of the basilar artery of the size of a pea, rupture of which caused death; gummata in both testicles. Nothing abnormal was found in the middle ear. Small granular projections were found upon the epithelium of the vestibular and tympanic part of the cochlea, which appeared as small amorphous granules. In the cochlea were observed between the epithelium and periosteum a fine, fairly extensive meshwork of connective tissue, through which scanty star-shaped connective tissue cells were scattered. Similar changes were found in the vestibule, especially in the perilymphatic spaces. At the point of entrance of the auditory nerve into the labyrinth, the nerve fibres were separated on account of collection of blood and round cells, and further toward the center there were numerous round cell infiltrations. Essentially the same changes were found on the right side, the meshwork being particularly marked. The writer considers the affection a periostitis interna of the labyrinth, probably of syphilitic origin. Lymphoma of the auditory nerves have previously been found in other cases of syphilis of the ear.

Levy.

Symptoms Pointing to the Necessity for Operative Interference in Mastoid Suppuration.

WENDELL C. PHILLIPS, New York. (*American Journal of the Med. Sciences*, Dec., 1901.) In acute suppurative middle-ear trouble, microscopic examination of the pus should be made. This pus is more virulent when the streptococci are in excess. The most marked symptom of acute mastoid inflammation is pain, coming on after the severe pain of the middle ear has passed away, and after discharge has been established. The pain is a dull, heavy one, not localized, but diffused over the surface of the temporal bone, and located most sharply behind and above the middle ear. This pain may or may not be constant, and will have some relation to the amount of discharge. There is usually marked pain on pressure, at the tip of the mastoid, but it is more significant when present over the mastoid antrum. The expression is not one of agonizing pain, but rather an unhappy one. The temperature may or may not be high. External periostitis may be considered as a symptom, although, as a rule, operative interference should be resorted to before this symptom appears. Bulging of the posterior superior portion of the wall of the canal, with tenderness upon pressure over the region of the antrum, is a prominent symptom.

Very early symptoms may be relieved by measures other than external operation. Free incision of the drum; local blood-letting; leeches; the Leiter coil; poultices; hot douching, once or twice an hour—are all abortive remedies that will sometimes avail. They should not, however, be used for a long time, as both the ice-coil and the hot poultice tend do do harm by masking the symptoms, if continued too long. The patient should be kept in bed. The exact time for operation must be determined by the good judgment of the operator.

Early operation seems to give better results for the hearing, and to render less liable the involvement of the brain or lateral sinus. The operation should not be done simply because it will do no harm, but only when positive indications for it are present, and then without unnecessary delay. The author does not believe in the Wilde incision, thinking that local blood-letting can be obtained by much simpler methods.

Tuberculous Otitis Media, Mastoiditis and Meningitis in an Otherwise Apparently Healthy Adult—Brief Report of a Case.

JAMES FRANCIS MCCAW, Watertown, New York. (*Medical News*, Oct. 12, 1901.) The case was one of intracranial involvement following a chronic otorrhea, with cerebral abscess as a probable diagnosis. Patient was 45 years old, of good health, with occasional attacks of pain in and around the ear, and some discharge, which was followed by relief of symptoms. The present attack had lasted seven weeks, patient gradually growing worse, becoming drowsy, and was in a deep stupor twelve hours before the operation.

On opening the mastoid the destruction of bone was found to be widespread, the entire space being filled with granulation tissue, the destruction extending upward and forward between the tables of the occipital bone, inwardly destroying the wall of the sigmoid sinus and inner table of the skull. On removing the granulation tissue and carious bone, the wall of the sigmoid sinus and meninges were found very much thickened, and everywhere studded with small typical miliary tubercles. There were several caseating patches on the wall of the sinus, which was, hower, pervious. Patient died twelve hours later. At the post mortem the lungs, liver, spleen and kidneys were found free of tuberculous infection and the mesenteric glands were not enlarged.

The case was one of tuberculous otitis media, mastoiditis and meningitis, and was not an operable case.

Author thinks the tuberculosis was primary in the middle ear and mastoid, and his researches seem to show that primary tuberculosis of the middle ear is of comparatively rare occurrence.

Aniline Oil, with the Report of a Case Showing Toxic Symptoms from its Use in the Ear.

HOMER DUPUY (*The Laryngoscope*, Oct., 1901) discusses a case in which a combination of cocain with aniline oil had been employed for the relief of earache.

Profound intoxication ensued. The lips and nails were of a bluish black color; face ashy in hue, skin cold and clammy. An intense sweat bathed the entire surface of the body. Pupils were apparently normal, pulse 136 and compressible, respiration 36, sighing in character. Temperature, by axilla, 97.3° F.

This bluish discoloration of the lips and finger tips remained for several days but then subsided, the patient remaining much prostrated. (We cannot with impunity place so toxic and so readily absorbed an agent as aniline in the hands of patients for purposes of frequent instillation.) *Seymour Oppenheimer.*

II.—NOSE AND NASO-PHARYNX.

Can Nasal Catarrh and Catarrhal Deafness be Cured?

CAROLUS M. COBB, Boston, Mass. (*Medical Record*, Sept. 7, 1901.) The author regards most cases of nasal catarrh and catarrhal deafness as due to some interference with the drainage from the nasal accessory sinuses, and these diseases should be treated by improving the drainage of the cavity from which the discharge follows. He does not think that postnasal catarrh is caused by mouth breathing, and says that operations upon the nose to relieve nasal obstruction are only useful to relieve the condition of the oropharynx and larynx and pharyngeal mucous membrane, but that they do not relieve post nasal catarrh except as they incidentally or accidentally improve the drainage from the accessory cavities. He thinks that sinus disease is much more common than was formerly recognized to be the case, and believes that the fact that over 90 per cent. of cases of disease of the nasal accessory cavities is unrecognized during life explains the failure to cure postnasal catarrh and catarrhal deafness. A number of cases are cited in which relief followed measures, such as the removal of the middle turbinate, which improved the drainage from the accessory cavities. *Richards.*

A Case of Epileptiform Convulsions Caused by a Shoe Button in the Nose.

J. S. STEELE (*The Laryngoscope*, Oct., 1901) reports a case of a child six years of age suffering from a mucopurulent discharge from the nose which was found to be due to a shoe button, which was lodged high up in the nose for a considerable period of time. Coincidental with the catarrhal process, the child manifested frequent epileptiform convulsions which, after the removal of the foreign body and the correction of the turbinal hypertrophies, have entirely disappeared. *Seymour Oppenheimer.*

Four Cases of Tumors of the Nose.

J. E. NEWCOMB (*N. Y. Medical News*, Oct. 1901) reports four extremely interesting and comparatively rare cases; namely, osteo-sarcoma of the inferior turbinate, true papilloma of the nasal septum, sarcoma of the branchial cleft and angeio-fibroma of the nose.

Seymour Oppenheimer.

The Nasal Septum.

W. J. FREEMAN. (*The Laryngoscope*, Oct., 1901.) In a very extensive and comprehensive paper, Freeman describes the embryonic and anatomic development of the nasal septum.

The pathologic conditions are considered according to the following practical classification:

1. Deformity. (a, deviation; b, dislocation; c, ridges and spurs.)
2. Hypertrophy. (a, of the tubercles; b, of the septal folds; c, of the mucous membrane in general.)
3. Atrophy, leading to deformity of the external nose.
4. Hematoma, followed by a, abscess, which may lead to b, perforation.
5. Ulceration, leading to a, perforation, and often to b, synechia.
6. Vascular dilatation.
7. Synechia.
8. Lupus, tuberculosis and syphilis.
9. Tumors.
10. Anomalies.

In discussing the etiology of septal deformity, the author says that excepting in the instances where deformities of the septum are due to traumatism or disease, we must look upon them for the most part as the results of evolutionary, or, perhaps, more properly speaking, of devolutionary changes. The external nose of certain peoples, the African negro, Egyptian, American Indian, and others, is more or less characteristic, and it is the result of centuries of exclusiveness, which thus preserved the purity of the races. The high or leptorrhinic nose of the dolichocephalic head needs a greater development of the septum than the low nose in the brachycephalic type; consequently in the intermarriage of different races, should the nose tend to follow the leptorrhinic character, say, of the father, while the rest of the facial bones follow the platyrrhinic type of the mother, there must necessarily be a bending of the septum, locked, as it is, in a frame already ossified. Broca, who has given special attention to the ethnologic study of the nose, finds that when one race has conquered another, the nose, as generations go by, begins to follow the type of that of the more numerous race. It is curious to note that the prominent nose of the Roman was almost always deviated, while that of the American Indian is almost always straight. May we not, however, argue that the Roman nation was a fast degenerating race, and that there was already a great admixture of foreign elements? In this country, and, in fact, in all civilized lands, the mingling of the races is very great, and this is undoubtedly one of the principal causes for the prevalence of septal deformities. *Seymour Oppenheimer.*

The Technique of Intra-Nasal Operations.

A. DENKER, (*Zeitsch. für Ohrenheil.*, Bd. 39), recommends the galvanocautery to prevent hemorrhage. In the removal of hypertrophies of the inferior and middle turbinate, the blood vessels should be cut through with the galvano-cautery. In resection of the cartilaginous and bony septal projections, he passes the cautery where possible over their base and above and below the mucosa as far as the bone or cartilage. *Levy.*

The Relation of the Middle Turbinate Body to Chronic Diseases.

CHARLES H. BAKER, Bay City, Mich. (*Philadelphia Medical Journal*, Dec. 28, 1901.) After reviewing the anatomy of the middle turbinate, the various affections are considered in connection with which its removal seems advisable. The middle turbinate ought to be removed whenever it interferes with free drainage from the accessory cavities; in connection with polypi formation concealed above and behind it; whenever there is fetid crusting in the upper portion of the nasal chambers in non-specific cases; whenever it is markedly hypertrophied, pressing hard against the septum; in cases of bullous hypertrophy; in many atrophic cases in which it appears to be the focus of infection; in cases of reflex sneezing, coughing, asthma, various eye reflexes, vertigo, tinnitus, chorea, epilepsy. In these latter cases the middle turbinate should be carefully examined and if in any way apparently causative it ought to be removed. In periodic vasomotor rhinitis, with pressure, sneezing, reflex cough, conjunctivitis, the removal of the middle turbinate may not entirely cure, but will greatly mitigate the severity of the symptoms.

Richards.

Foreign Bodies in the Nose and Ear.

PERCY FRIDENBERG, New York. (*Medical Record*, Sept. 21, 1901.) This is a resume of the subject, with full details as to the best methods of removal. *Richards.*

On the Use of A. C. E. Mixture and Ethyl Bromid in Operations for Adenoid Vegetations.

J. W. GLEITSMANN, New York. (*Medical Record*, Nov. 2, 1901.) The author formerly used the A. C. E. mixture entirely, and usually operated at the patient's home. Now he uses ethyl bromid and operates in his office with trained assistants. He has never had any unpleasant experiences with this agent. The clothing must be perfectly loose, and a tight fitting mask is used. The ethyl bromid is administered in an upright position and operation done in this position. Merck's one-ounce glass tubes are used, and generally less than 30 gms. is sufficient to allow time for the removal of both tonsils and adenoids, and the recovery from anesthesia is rapid. No indrawing of blood into the trachea, cough or subsequent pulmonary symptoms have been observed. *Richards.*

Therapy of Chronic Empyema of the Maxillary Sinus Including Methods of Operation.

ALSEN. (*Archiv für Laryngologie*, Bd. XII). The treatment of maxillary sinus suppuration always tries the patience of both physician and patient. The treatment often continues unbroken for years without cure. The writer believes that there is a constant renewal of the infection of the cavity if the opening in the canine fossa must be kept open; and if it is closed by a hard rubber plug it is impossible to guarantee an aseptic closure. The writer, working in Gerber's Clinic in Königsberg, established a wide communication with the middle meatus of the nose and closed the oral wound after removing the diseased portions of the mucosa in those cases requiring opening in the canine fossa. The after-treatment was carried on through the nose. The sutured portion heals generally in a week. The after-treatment in all the eleven cases was carried on without difficulty. In one case only, in which there was considerable caries, was it necessary to remove the sutures and carry out the treatment in the usual way. The method does not seem to be suited for such cases. In all the other cases, complete cure, or at least cessation of symptoms followed. The communication with the nasal cavity remains. *Levy.*

The Genesis of Hyperplasia of the Pharyngeal Tonsil.

BRIEGER. (*Archiv für Laryngologie*, Bd. XII). We are not in a position to establish a sharp line between normal and pathologic pharyngeal tonsils which are enlarged and therefore to be removed. The symptoms are not always in relation to the size of the growth. From the standpoint of etiology, heredity plays an important role which is, however, not to be overrated. Constitutional anomalies are rather of importance. Scrofula is certainly of importance, still, as is well known, the picture of the scrofulous habitus may be occasion by adenoid vegetations; and when they are removed it may disappear. Hereditary syphilis causes tumors which may deceive us as to the clinical picture, but which will show a difference when submitted to anatomic examination. The same is true of leukemia. Typhoid fever may stimulate the growth of the pharyngeal tonsil. The writer believes that the influence of the constitutional factor is not demonstrated, but that on the other hand, hyperplasia of the pharyngeal tonsil is a local manifestation of the hyperplastic process in the entire lymphatic apparatus. The influence of cleft of palate is not so important as heretofore held. The assumption that the swelling is of an inflammatory character has no support in the anatomic findings. On the contrary, the structure of the enlarged tonsil corresponds to the normal. It is a simple hyperplasia. The writer, therefore, comes to the conclusion that the special function of the pharyngeal tonsil in connection with the emigration of the white blood cells is established, that it is a protective organ and that it has the function of eliminating poisonous matters. The hypertrophy is to be considered in a teleological sense as the measure of the protection of the organism. The increased disposition to infectious diseases in children depends upon the fact that it is largest in that period of life. *Levy.*

Recurrence of Hyperplasia of the Pharyngeal Tonsil.

MAX GORKE. (*Archiv. für Laryng.*, Bd. XII.) Recurrences are found even when the operation is complete. It is not necessary for us to think of malignant tumor, even if sarcomatous tumors do occur hiding from view the pharyngeal tonsil. Tuberculosis plays just as slight a role in the recurrences. The writer tried to arrive at a solution of the question through the medium of anatomic investigations. Generally, in complete removal, the basilar fibrocartilage is laid bare. However, small portions of the adenoid tissue remain in the recesses. By reason of the regenerative power of the lymphatic tissue, the new tumor arises from these, agreeing with the original tumor in structure, except that the layers are not so sharply separated as usual, and the connective tissue elements occupy more space. The lymphocytes come in all likelihood from emigration from the blood vessels, or perhaps, also from the lymphatics in the newly constructed tonsil. This regeneration occurs in all cases. To what extent this occurs, depends upon whether the cause which induced the primary hyperplasia still operates, or an increased function is required. *Levy.*

III.—MOUTH AND PHARYNX.

Are the Tonsils to be Regarded as Normal Physiologic Organs of the Body.

Francke H. Bosworth, New York (*Medical Record*, Jan. 11, 1902), reiterates the assertion made by him twenty years ago, that practically there are no tonsils in a healthy throat, and states that he is of the same opinion still, regarding the tonsil as a morbid growth or tumor which should be removed. He thinks that we have some justice for advocating the view that the almond-shaped organ in the fauces, which the old anatomists called the tonsil, has not justified its claim to be considered one of the normal organs of the body, either on anatomic, physiologic, or clinical grounds. He goes still further, and thinks that it constitutes a distinct menace to the health and welfare of the body in the filthy lacunæ which make up its main bulk.

For removal he uses general anesthesia in young children, giving preference to chloroform, and instead of the tonsillotome uses the cold wire snare, regarding this much more effectual in the thorough removal of the growth than the tonsillitome, and avoiding the danger from hemor-

rhage. The extirpation should be thorough, since a partial extirpation of the tonsil occasionally leaves the throat in as bad if not in a worse condition than before operation.
Richards.

The Function of the Tonsils, with a Few Suggestions Regarding the Differential Diagnosis of Tonsillar Affections.

R. C. MATHENY, Galesburg, Ill. (*Medical Record*, Sept. 14, 1901.) The author regards the common idea, that the limit of normal tonsillar tissue is on a level with the pillars of the fauces, as erroneous and does not consider the tonsil as an organ devoid of value, nor the circle of lymphoid tissue in the pharynx as being there by accident. Lymphoid tissue is the rendezvous of the leucocyte, concerning the action of which we as yet know but little. It must be of value to the economy, otherwise why are these structures always normally present to a greater or less extent.

The four faucial,lingual and pharyngeal tonsils have been put in the gateway leading to the stomach for some purpose, and he thinks that in childhood these lymphoid masses and nodules are a great preventive of many infectious processes. He does not consider that because the tonsils are subject to many inflammatory attacks they are therefore useless and ought to be removed. On passing from childhood to adult life the tonsils usually show a gradual retrograde process, since their need as protective agents seems to be less than in childhood.

The main questions concerning the tonsils should be: Are they dangerously pathologic? Have they degenerated to such an extent that they have lost their function and become inimical to health? They should not be excised simply because they project beyond the faucial pillars, nor does the child who has had one or two attacks of tonsillitis and who has prominent tonsils, necessarily need to have them excised. He regards much that has been said regarding follicular tonsillitis as the cause of secondary infections, to be erroneous.

Tonsils should be excised for the following conditions: Simple hypertrophy, when it is so great as to prevent the entrance of sufficient air in breathing; hypertrophy when accompanied by recurring attacks of tonsillitis; chronic degeneration; when the crypts are filled with caseous matter and accompanied by foul breath; in lupus, tuberculosis and malignant growths; when there is interference with proper voice production. *Richards.*

Disagreeable Odor From the Mouth, Cause and Treatment.

Ritter. Fetor ex ore is a very common and vexatious disorder, the most frequent cause of which lies in the teeth. Attention should be given to caries, alveolar pyorrhea, tartar formation, fungus epulis, bad roots and carious teeth. Prosthetic appliances and obturators should be kept clean. Simple gingivitis may cause a bad odor. Fetor may remain some time after the removal of a tooth from septic wounds. In these cases applications of carbolic acid solutions (one per cent.) or peroxid of hygrogen are of service. The odor is often caused by diseases of the nose and throat. Likewise, particles of secretion and saliva which lie in the crypts of the palatal tonsils, tonsils plug, ozena, empyema of the accessory cavities, chronic stomach diseases, carcinoma, bronchitis, bronchiectasis and cavities. Sometimes it is found in apical catarrh with slight secretion. The following is a refreshing mouth wash:

℞	Tinc. Colom - - -	10.
	Tinc. Myrrh - - -	8.
	Olei. Menth. Pip. -	9u viij.
	Spir. Vini. rect. - - -	90.
	Aquae. Dest. - - -	90.

M. Sig. Half teaspoonful in a glass of water.

Particularly disagreeable is the fetor in tuberculosis and diabetes where fermentation of the stomach contents takes place some time after meals. Then menthol is of service, or validol, a combination of menthol and valerianic acid. In less frequent cases fetor is observed in bladder affections. The odor following mercury and iodin administration is characteristic. Prophylaxis is important. *Levy.*

The Occurrence and Treatment of Phlegmon of the Pharynx.

L Grunwald. The so-called peritonsillar abscesses are to be differently considered from etiologic, anatomic and therapeutic standpoints. Ordinarily it is a supratonsillar phlegmon which originates in the fossa supratonsillaris and which should be opened with a probe in this position (Killian). The symptoms are trismus, swelling and redness of one side of the palate, edema of the soft palate and uvula, absence of tonsillar swelling. The uncommon, true peritonsillar abscess, results from disease of the teeth or from foreign bodies, and progresses since the tonsil lies external and anterior to the surrounding connective tissue and is marked by edema and swelling of the palatine arch. Erysipelatous pharyngitis has a similar course. Tonsillar abscess proper is also uncommon. Swelling is considerable, but trismus is lacking. Pus will be found in these cases if a curved probe is introduced downward from the fossa supratonsillaris; also into the tonsil. Chronic tonsillar abscess may result. Acute retronasal phlegmon may clinically occasion a similar picture. High fever, severe prostration, dysphagia with typical typhoid symptoms may show themselves until the pus is emptied into the nose. If toxic symptoms occur, then the picture of Senator's acute infectious phlegmon appears. *Levy.*

Retropharyngeal Abscess From Otitis Media Suppurativa.

G. KIEN. (*Zeitsch. für Ohrenheilk*, Bd. 39.) Burrowing abscesses of the throat from otitis media are fairly common, but retropharyngeal abscesses following middle ear suppuration have not been frequently observed. The writer reports four cases. The first, was an acute otitis media in a woman,aet.47. In the neighborhood of the ear, descending half way down the neck, was a large fluctuating tumor; pressure caused pus to come out of the ear. The mucosa of the pharynx, especially upon the affected side, was greatly swollen. Mastoid edematous. On operation, the apex of the mastoid and the tendon of the sterno-mastoid were found necrotic. From this point, a cavity filled with ichorous pus passed down the neck, reaching backward to the trapezius, anteriorly being separated from the pharynx only by the mucosa. Facial paralysis appeared. Healing of the large abscess cavity, filled with necrotic masses, occurred after a prolonged time, being complicated by an aspiration bronchitis.

The second case was one of acute suppuration in a man, aet. 20, upon whom Schwartze's operation has been performed. Pain appeared in various joints two days later. An infiltrated painful point appeared behind the wound two weeks later. There was pain on swallowing and fever as high as 40°C. A second operation was without result; on the contrary, in the course of eight days difficulty of swallowing appeared and the posterior lateral wall of the pharynx projected forward. Pus was discharged upon incision at this point, and for a few days the symptoms improved, recovery taking place after a second incision.

The third case was one of acute suppuration in the right ear of a man, aet. 56. On operation, an extradural abscess was found in the posterior cranial fossa. Three days later, a hard painful infiltration appeared on the right side of the neck and likewise on the right wall of the pharynx. Spontaneous rupture of the abscess occurred at this point. It was observed that pressure upon the cervical infiltration caused pus to come out of the bony cavity. A second operation revealed a large cavity filled with pus under the horizontal sinus, which reached backward and inferiorly to the pharyngeal mucosa. Recovery followed operation.

In the fourth case, paracentesis was performed on account of acute otitis. In spite of this, fever persisted for eight days. Pain upon swallowing and motion of the jaw which was present, disappeared after expectoration of blood and pus. The antrum being opened, a fistula was found on the floor passing anteriorly and inferiorly to the pharynx mucosa and discharging pus. After proper section, the condition was cured. *Levy.*

Unusual Foreign Body in the Pharynx.

W. STANLEY SAMSON. (*The Laryngoscope*, Oct., 1901.) An unusual foreign body in the pharynx has been described by Samson; the patient, aged thirty-three, giving a history of nasal syphilis contracted six years ago. The bony septum had entirely sloughed away. A piece of this bone, becoming dislodged, had caught in a pocket of adhesions between the soft palate and the posterior pharyngeal wall. The plate of bone, after removal, measured 25 x 32 mm. *Seymour Oppenheimer.*

Articular Complications in Non-Diphtheritic Anginas.

E. POINOT. (*Bulletin de Laryng. Otolog. et Rhinol.*, Mar. 30, 1900.) The thesis begins with a brief history of infectious pseudo-rheumatism. Then the author tries to establish the relations which join acute articular rheumatism, a specific disease, to the anginas, and shows that in true articular rheumatism the inconstant angina is in every case only an incident of the disease, and that we should not consider the articular symptom as even complications of the angina.

The author reports eleven observations of articular symptoms in the course of angina. In three cases they were simple arthralgias.

In four, there were acute non-suppurative arthritis. In the last four, there was suppuration of the joint. Of these eleven observations, two were personal.

Then the author reviews the etiology, pathogenesis, physiologic anatomy, symptomatology, diagnosis and prognosis of these complications.

Pharyngeal Abscesses Simulating Adenitis, or Sub-maxillary Adeno-phegmon.

H. POIRIER. (*Bulletin de Laryng. Otol. et Rhinol.*, Mar. 30, 1900), commences by giving a very complete description of the pharynx from an anatomic point of view, laying stress on the description of lymphatic ganglia of that region, points of origin, in the vast majoriiy of cases, of pharyngeal abscesses.

Then, having reviewed the etiology, symptoms and treatment of pharyngeal abscesses in general, he adds a special study of latero-pharyngeal abscesses. He dwells on their relative frequency in the adult, on the symptoms which distinguish them from retro-pharyngeal abscesses, and especially on those which differentiate them from submaxillary adeno-phegmon, of which the most important is the presence of a *pharyngeal edema* in latero-pharyngeal abscesses.

The most rational treatment of latero-pharyngeal abscess is the external incision. Eleven observations are added, of which two are by Aviragent.

IV.—LARYNX.

Skin-Crafting in the Treatment of Complete Stenosis of the Larynx.

ANDREW McCOSH, New York. (*Annals of Surgery*, Nov., 1901.) After operations on the trachea where a tracheotomy tube has to be worn for a long time, stenosis of the larynx or trachea above the wound not infrequently takes place, and attempts to relieve this condition have been for the most part unsuccessful. Dr. McCosh reports a case in which laryngo-fission had been performed for multiple papillomata of the larynx in 1895, tracheotomy having been done through the third and fourth rings. Since then the tube had been constantly worn. The operative procedures were begun in November, 1900, at which time the windpipe, from the epiglottis down to the second ring of the trachea, was completely obstructed. Chloroform was administered through the tracheotomy tube, and a three inch incision made in the median line of the neck from half an inch above the tracheal fistula to the hyoid bone. The larynx was found much shrunken and deformed, and on cutting into it no canal could be found. The trachea was much contracted, while the cartilages inclosed a solid tube of cicatricial tissue. Even a probe could not be passed through the glottis. The hyoid bone was divided, the laryngeal walls laid apart, and some of the cicatricial tissue excised. Considerable bleeding followed, and the wound was tamponed. This wound was kept open for thirteen days, chloroform again administered, the laryngeal walls spread apart by retractors, and a considerable amount of cicatricial tissue excised. An assistant was able, with the fingers in the mouth and the forceps pushed up from below, to push up the shrivelled epiglottis and to stretch the cicatricial contraction of the glottis so that a rubber tube, No. 22 (F), could be drawn upward. The remainder of the trachea was then opened, cleared of its cicatricial tissue, and the rubber tube laid in the new canal; its lower end, to which a string was attached, extending down to the opening in the trachea, and its upper end, to which also a string was attached, projecting out of the mouth. One suture of silk about the middle of the larynx drew its edges together and aided in retaining the rubber tube. Eight days later chloroform was again administered, the tube removed, the new laryngeal and tracheal canal made still larger by the excision of more cicatricial tissue, and its interior from the first tracheal ring to within half an inch of the glottis was grafted by a Thiersch graft taken from the thigh. This was rolled around a rod of gauze covered with rubber tissue, and laid in with the raw surface of the graft against the bleeding surface of the new tracheal canal. The section graft was about three inches in length. From the glottis a silk thread was carried, emerging from the mouth.

The graft took throughout its entire length, and three weeks later the anterior wall of the windpipe was formed by dissecting loose the skin edges of the wound and uniting them by suture in the median line, and a tube the size of No. 22 (F) inserted, its lower end resting against the tracheotomy tube and its upper end projecting through the mouth and attached at each end to the patient's neck and chest by strings. Two days after, the tube accidentally slipped out and was replaced under chloroform. With occasional changes the tube was worn continuously during the next three months, No. 24 (F) being the calibre which was most easily borne. At this later time an intubation tube was substituted, the previous tubes having been of soft rubber.

The intubation tube is occasionally expelled, owing to there being no arytenoids or projections to maintain it in place, and is sometimes not replaced for hours, during which time the boy breathes through his larynx. He can also breathe through it comfortably when the tracheal opening is closed by a pad of gauze. The intubation tube has remained out without sign of closure as long as 24 hours, and the author expects later to close the tracheal fistula and allow the patient to breathe through the newly formed skin-grafted artificial trachea and larynx.

(The subsequent history of this case will be of interest, and the reviewer hopes to report on it at a later day.)

Richards.

An Instrument for Papilloma Operations.

I. NEMIA, Budapest (*Monatschrift für Ohrenheilk.*), recommends an instrument devised by him for the treatment of papilloma in children. It is a simple metallic catheter having a round opening in the lower end, with highly polished edges so arranged that it may be placed in any position. Secondary injury is excluded by the employment of this instrument. In addition, the writer observes that in some cases, treatment of the recurrences of papilloma miscarries, and sometimes simple tracheotomy and the consequent rest of the larynx suffices for cure. *Levy.*

Laryngitis Submucosa Infectiosa Acuta.

A. ONODI. (*Archiv für Laryngologie*, Bd. XII.) Up to the present, there has been no unanimity of opinion as to whether we should consider primary erysipelas of the larynx, acute infectious phlegmon of the pharynx (Senator) and angina Ludovici as identical diseased conditions of different intensity, or as conditions requiring a more distinct division. The writer reports three cases. Fraenkel's diplococci were found in one case and staphylococci in the others. If we hold that the cause of erysipelas, in accordance with recent investigations, agrees with the cause of suppuration, in so far that either of these may produce pus or erysipelas, we must join in the writer's opinion that all of these affections must be grouped under the name announced in the title. The special variety may be indicated by adding the word erysipelatosa, phlegmonosa or necrotica.

V.—MISCELLANEOUS.

The Hemorrhagic Diathesis in Relation to Operation on the Nose and Throat.

E. Harrison Griffin, New York. *(Medical Record,* Dec. 7, 1901.) Several cases of profuse hemorrhage after operations of moderate severity, and in which the patients denied the hemorrhagic diathesis, are reported. In one instance, after removal of a portion of the inferior turbinate, severe hemorrhage followed fifteen minutes after the operation,and when the nose was thoroughly plugged the hemorrhage continued through the lacrimal duct. The plugs were removed on the fourth day, but on the sixth day after the operation, a severe hemorrhage, requiring plugging of the nose and the administration of morphin, appeared. Careful investigation of the family history revealed the fact of the patient's being a bleeder.

In another instance, after the excision of the tonsil there was copious bleeding for several hours until fainting took place, and oozing continued to the fifth day.

Another case is cited of a girl of sixteen, in whom, after removal of the tonsils, hemorrhage continued off and on for one month.

Another case that bled after operation for an obstructed nose, on examination developed the history that only a week before he had come near bleeding to death, and had to have a transfusion of milk to save his life. Notwithstanding this he denied the hemorrhagic diathesis until closely questioned.

The author also quotes a case in which severe hemorrhage followed an operation for deflected septum. The patient was sent to the hospital for the hemorrhage, left in three days, and two days later hemorrhage again took place, and this time was so severe that the patient died.

In all of these cases there was a hemorrhagic diathesis. Hence the need before any operative procedure to inquire very closely into the question of the presence of any hemorrhagic diathesis. It is necessary to go into every detail since the patient will frequently deny all knowledge of being a bleeder. *Richards.*

Cinchonism and its Effects Upon Articulation and Vocalization.

CARL SEILER. (*Medical Record*, Oct. 26, 1901.) Carl Seiler discusses a series of tests of the effect of tinnitus aurium, and aural symptoms of what is generally called cinchonism, as well as of external nonsubjective noises, upon vocalization, and particularly upon articulation, most prominently noticed by the subjects in the pronunciation of certain of the consonants.

The ordinary tinnitus due to middle ear disease never transgressed the limits of pitch from "d, 287 vibrations, as the lowest point to the "f^2," 704 vibrations, as the highest. These subjective noises would invariably affect the perception of sound, but had no appreciable effect upon vocalization or articulation.

The subjective noises of so-called cinchonism, as produced by the systemic toxic effects of various drugs, were found to be invariably of high pitch; lowest when quinin was used, and highest when salicylate of soda produced the subjective sensation.

Any composite sound of high pitch, such as the hissing of escaping steam, not only interfered with the pronunciation of these consonants which have for their characteristic a combination of sounds of very high pitch, such as "th," "s," "st," "z" and the like consonant sounds of articulate speech, but also caused them to be easily obliterated, and consequently most difficult to be appreciated and recognized by the ear.

This is explained by the well-known acoustic law of interference with each other of sound waves of the same, or nearly the same, length, and that the higher the pitch of two non-harmonious sounds, the greater the difference can be in the number of vibrations allowing interference. But acoustic or physical laws fail us completely when a subjective, in reality physically non-existing noise, such as that of cinchonism, materially interferes, as it undoubtedly does, with the pronunciation of those consonants of high pitched composite characteristic sounds, and even alters the quality and timbre of the high-pitched vocal sounds.

Seymour Oppenheimer.

Subcutaneous Paraffin Injections.

FERD ALT. (*Monatshefte für Ohrenheil.*, Bd. 35.) Gersuny has used for two years, for plastic purposes, paraffin melting at 36 to 40° C. This method has been of service in cases of incontinence when there was destruction of the sphincters, also for the improvement of speech after cured perforation of the palate and to close smaller perforations in similar cases. The best results are observed in the correction of deformities, especially saddle-shaped nose. The writer has employed this method after the radical operation where a large opening remained behind the auricle. After injection of cocain, the parafin is injected around the border of the opening in four places, about one-half cubic centimeter altogether. Reaction is slight. The fistula was so small that it would only admit a bristle. Besides this, the writer employed the method in a case where perichondritis of the auricle with disfigurement followed the radical operation. Injection of a small amount caused the crumpled auricle to assume its normal length and breadth. In a similar way congenital deformities may be corrected.

Levy.

Foreign Bodies in the Bronchi.

E. JURGENS. (*Monatschrift für Ohrenheil*, Bd. XXXV), employed systematic massage of the back several times a day in a case in which a large piece of bone fell into the right bronchus. The foreign body was coughed up fourteen days later, during treatment. The writer believes that this method was responsible for the result.

Two New Cases of Foreign Bodies in the Bronchus.

O. WILD. (*Archiv. für Laryngologie*, Bd. XII), assistant of Killian, reports two new cases which were diagnosticated and operated upon after his method.

The first case, was a woman, in whom a piece of bone lay in the right upper bronchus. Killian attempted to deliver it by turning the patient to the opposite side after introducing the laryngoscope. After Killian introduced the tube and cleared away the mucus with cotton, it was seen that the foreign body had changed its position and after a few days it was found in the inferior bronchus. The removal was difficult since the mucosa was swollen over it like a ring. After tracheotomy, the foreign body was seen through the agency of inferior bronchoscopy and Killian recovered it with a Lister's bent hook.

The second case was a six-year-old boy, in whom a piece of a bean entered the air passage. In three days the temperature rose to 39° C. with intense dullness in the right inferior lobe. Direct bronchoscopy was undertaken under narcosis and the bean was found in the right main bronchus. An attempt to remove it with a sharp tenaculum was unsuccessful, on account of it being a dry bean. Then an attempt was made to place a blunt hook behind the bean, to press it against the lower opening of the tube and thus to remove it. It was possible to move it, but only a piece of the cortex of the bean came out with the tube. The bean fluttered here and there in the trachea. It was therefore necessary to introduce the instrument again when it was possible to remove the bean in pieces with a pair of forceps. The course was entirely normal.

In this case, the reintroduction of the tube was an unfortunate occurrence, since it necessarily prolongs the operation. On this account, Killian constructed a conducting tube with a slit, which can remain during the entire operation and it is possible thus to remove large foreign bodies whose greatest diameter corresponds to the slit of the conducting tube. *Levy.*

Speech as a Factor in the Diagnosis and Prognosis of Backwardness in Children.

G. HUDSON MAKUEN (*Journal of the American Medical Association*, Oct. 12, 1901) concludes that it is not always possible to determine at a glance the cause of backwardness in children, and that backwardness is not always due to the central lesion, but may be the result of arrested cerebral development, due to some abnormality of structure in the peripheral organs.

The speech centers are so closely related to the ideational centers of the brain that any impairment of the one generally results in a corresponding impairment of the others. The best method of arriving at even a proximately correct prognosis in cases of backward children is to apply the speech test, or, in other words, to ascertain by careful study and experiment to what extent the faculty of speech may be improved, and it will be found that in those who are susceptible to training in what may be called the refinements of speech are the ones for whom we may promise the best results, and that possibilities for general development will be proportional to the capacity for speech development. *Seymour Oppenheimer.*

Removal of Foreign Bodies From the Air Passages.

WILLARD DE FORREST (*Journal of the American Medical Association*, Oct. 26, 1901), in a resume of the subject, concludes that coughing should be encouraged, and forcible inspiration restrained. Inversion in the prone position, as a domestic practice, is advisable. Laryngoscopy is helpful if the body is lodged at the vocal cords. It may be extracted by forceps or by laryngotomy. If time permits, the X-ray may be brought into serviceable use for diagnosis. Careful diagnostic investigation is important to determine the actual presence of an impacted body, and its location. Tracheotomy under local anesthesia should be the rule if the object is lodged at the bifurcation or in the bronchi. Tracheoscopy, suction and forceps' manipulation must be cautiously employed. Prolonged instrumentation adds greatly to the danger of pneumonia. If extraction is not secured through the tracheotomy wound, the chest wall should not be invaded unless an artificial respiratory apparatus, like the Fell-O'Dwyer, is at hand, and oxygen available. With the assistance of these appliances, however, the bronchus may be reached, anteriorly or posteriorly, since, by their use, rhythmical movements can be maintained.

Resultant abscess of the lung should be treated by incision and drainage. *Seymour Oppenheimer.*

The Bucco-Naso-Pharyngeal Origin of Meningitis.

JACOBSON. (*Bulletin de Laryng. Otol. et Rhinol.*, Mar. 30, '01. Ordinary tubercular meningitis seems to have its origin on the niveau of the oral, nasal or pharyngeal mucosas. The germs journey along the lymph and blood vessels, and also the sheathes surrounding the nerves. Although their point of departure is the niveau of the mucosas the observer finds them only in the deeper tissues and organs, since the primary lesions have had time to be cured, after having given passage to the germs to the ganglia and deeper structures. The organs which receive the pathogenic microbe, very often in a latent state, are the ganglia, tonsils and the adenoid organs.

BOOK NOTICES.

Transactions of the Tenth Meeting of the German Otological Society.

Verhandlungen der Deutschen Otologischen Gesellschaft auf der Zehnten Versammlung in Breslau am 24 and 25 Mai, 1901. Jena, Gustav Fischer. 8 marks.

Dr. Hartmann has presented a carefully edited, and of course authoritative, volume. Besides the business matters of the society and exhibitions of cases, instruments, etc., there are 29 original papers, with the discussions upon them. I can do no better than to give the titles of the most important ones, for a review or critique can scarcely be within the functions of the reader. (1) and (2) The present condition of the theory of otogenous pyemia; (3) Musical disturbances in hearing; (8) Intranasal vaporization; (18) Study of overtones, harmonies, and the Helmholtz theory of tone perception: (19) What is the origin of vertigo? (20) Entotic tones; (21) Origin of deafmutism; (23) Chronic otitis of the temporal bone; (24) Caries of the ossicles; (25) Four cases of rhinoscleroma; (26) Path of infection in meningitis after frontal sinus suppuration; (27) Muscles of the right ethmoid bone; (29) Treatment of middle ear disease.

The discussions provoked are necessarily of interest, but cannot be abstracted. The publisher, who has recently issued these transactions from the fourth meeting in Jena, 1895, offers the six volumes together at a price of 21 marks. If they all are as valuable as the one before me, this is a bargain indeed. A. B. Hale.

Klinische Vorträge.

Klinische Vorträge aus dem Gebiete der Otologie und Pharyngo-Rhinologie. Herausgegeben von Prof. Dr. Haug (München) Jena: Verlag von Gustav Fischer.

(1) Fünfter Band, Erstes Heft. Ueber Erschütterung des Ohrlabyrinthes (Commotio labyrinthi): von Dr. R. Spira in Krakow, 1 mark, 80 pfennig.

(2) Vierter Band, Sechstes Heft. Die Entzündungen des Aüsseren Gehörgouges, von Wilhelm Grosskopff in Osnabrück. 60 pfennig.

(3) Die Bacteriologie der Acuten Mittelohrentzüngung von Dr. Hasslauer. 2 marks, 50 pfennig.

These lectures, so-called, are in reality nearly exhaustive monographs on their special subjects, and contain a newer literature and often fresher presentation of the subject than can be found in the average text book.

No. 1, on Commotio Labyrinthi, is as its title implies, restricted to the discussion of functional disturbances of the labyrinth, what is roughly termed Meniere's Disease. The author uses the classic arrangement of etiology, symptomatology, pathogenesis, diagnosis, prognosis, forensic significance (a valuable suggestion), prophylaxis and treatment. Whether there is to be found in it anything new, must be left to the judgment of the individual reader, based upon his experience and knowledge of the subject, but certainly no one can help being better informed and more alive to the subject after reading these 70 closely printed pages.

No. 2. The Inflammations of the External Auditory Meatus is a delight for its clearness and simplicity. The author admits of but two characteristic conditions: circumscribed and diffuse otitis externa, the former advisable into acute and chronic (furunkel), the latter into simple, hemorrhagic, croupous, diphtheritic, ulcerous and parasitic. Nearly all of the fourteen pages discuss treatment, thorough and easily applied.

No. 3. The Bacteriology of Acute Otitis Media is a systematic investigation produced after the manner of an inaugural thesis. The reviewed literature embraces 158 references (chiefly German). The author examined 58 middle ears on 29 fresh cadavers. Of these, six had a purulent inflammation and were therefore excluded. Four had fluid in them. The remaining 48 were macroscopically normal. Of these, 23 contained pathologic organisms, 21 were sterile.

Hasslauer puts these questions, the answers to which he gives at at the end of the study. These questions are:

(1) How do germs enter the middle ear?

(2) Is the normal middle ear free from germs?

(3) Is the simple presence of germs sufficient to produce an inflammation, or must some exciting cause act as stimulant to its production?

His conclusions are as follows: (1) Germs enter by (a) the Eustachian tube; (b) the lymph spaces connecting nose with middle ear; (c) the external ear, after perforation; (d) blood and lymph vessels.

(2) The normal middle ear of animals is not free from germs necessarily.

(3) Germs alone do (will) not cause an inflammation; for this some existing cause is necessary.

Such work is well worth reading, and forms a solid ground on which to erect our structure of diagnosis and treatment.

A. B. Hale.

Traite Medico-Churgicale de Maladies du Pharynx.

E. Escat, Paris, Georges Carré et C. Naud, 1901.

This most excellent work has many features to commend it, even to those who have practiced laryngology for years. Not the least of these is the classification of pharynx diseases. For instance, the acute inflammations of the pharynx are divided into the acute superficial (affecting the mucosa alone), the submucous, and the variety affecting all the tissues. Of the first of these he makes three groups: Catarrhal, including palatial, pharyngeal and lingual amygdalitis, and the pharyngitis of rheumatism, scarlatina, measles, grip and typhoid fever; the vesicular comprising infectious herpes, buccopharyngeal zona, herpes récidivant and the pharyngitides of variola, varicella and aphthous fever; the pseudo-membranous, including diphtheria, streptococcal, pseudo-membranous and diphthero-streptococcal infection and the pseudo-diphtheritic infections of staphylococcus, pneumococcus, bacterium coli, bacillus of Friedländer cocci, oidium albicans, tetragenus, etc.

Under the classifiation of submucous anginas he groups abscess of the palatine, lingual and pharyngeal tonsils, peritonsillar, retro-pharyngeal and latero-pharyngeal abscess.

The chapters on syphilis and tuberculosis are particularly well written. Primary syphilis of the pharynx is minutely described, the chancres themselves being properly considered in accordance with the different varieties attacking the pharynx, viz., the erosive, ulcerative, vegetative, diphtheroid, gangrenous and the anginous form. The difficulties of diagnosis are pointed out and the way made clear as possible.

The writer believes that primary tuberculosis of the pharynx begins in one of the four tonsils resulting from inoculation with the tubercle bacillus. In secondary tuberculosis the infection takes place in one of three ways: Ascending through the respiratory passages, through the lymphatics (rare) or through the blood. The disease may be acute or chronic, the latter including the chronic ulcerative, the chronic vegetative and the chronic suppurative forms. The last two hundred pages are devoted to tumors, adhesions, neuropathies, hemorrhages, foreign bodies and malformations. A most valuable addition to the literature upon the pharynx.

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X.

RHEUMATISM OF THE NOSE (RHINITIS RHEUMATICA).*

By W. Freudenthal, M. D.,

NEW YORK.

In a paper read, in 1894, before the Section on Laryngology of the New York Academy of Medicine, I drew attention to a certain class of diseases, which had come under my observation and which had not been hitherto described, viz: the rheumatic affections of the nose. I said that "*a priori* I could not see any reason why we should speak of rheumatism of the pharynx, of the larynx, and not of rheumatism of the nose. We have in this organ a mucous membrane which responds to the slightest deviation of the normal temperature with an inflammatory reaction, we have cartilages, muscles and nerves just as well as in other organs. Only the articulations are not as typical here as on other parts of the body, but this is of little importance. Naturally, I will not call every little coryza, which follows a catching of cold, rheumatism of the nose, although a great many of these cases are of rheumatic origin.

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*Read before the Eastern Section of the American Laryngological, Rhinological and Otological Society, New York, March 1st, 1902.

I shall limit myself only to chronic cases, which to my knowledge have not been described in literature."

Since I wrote this article seven years have elapsed, and during that time I have seen many more cases of this condition, some of which I shall describe later on. Although the above paper has been quoted quite extensively, very few similar observations have been published by other authors. Perhaps we are still so much under the influence of the accessory sinus diseases that other matters are easily overlooked. In 1897, F. De Havilland Hall said in his excellent Lettsomian Lectures on Diseases of the Nose and Throat:* "Rheumatic affections of the nose have received but little attention. I cannot say that I have seen any cases in which I could assure myself that rheumatism was the cause of the symptoms referred to the nose, with the possible exceptions of a few cases in which patients complained of pain at the point of emergence of the nasal branches of the superior maxillary nerve, and even in these cases, the rheumatic origin of the neuritis is problematical. Freudenthal, however, states that a number of cases have come under his observation." Then he goes on to describe my cases.

In 1899 Sendziak, of Warsaw, wrote an excellent monograph "On Rheumatic Affections of the Pharynx, Larynx and nose."† This author so far is the only one who has published cases similar to mine. He says (p. 250): "Although there exist in the literature various isolated references in regard to the rheumatic origin of certain nasal affections (Grenham for example observed in 1880 seven cases out of fifty nasal hemorrhages during the course of acute articular rheumatism; so did Shaw) the first to discuss this question more thoroughly was Freudenthal in 1895. It seems to me that this author justly propounds the question: Why, if we believe in the rheumatic origin of affections of the larynx and pharynx, should we not extend this view also to certain nasal diseases? There is not the least doubt that a certain number of acute nasal catarrhs, originating from colds, must be ascribed to rheumatism. The same holds good for the acute affections of the lateral sinuses, where, besides the local symptoms, the patient very frequently also complains of general painful lassitude, as well as of pains in the joints, muscles, bones, etc." Sendziak has seen cases very similar to mine which he describes in detail. I would like to refer the reader to this very interesting paper. In reference to his remarks concerning Grenham's and Shaw's cases of nose-bleed, I would say that these authors attribute this symptom to the use of the salicylate of soda, which had been administered for the existing articular rheumatism.* They were not aware of the fact that there is such a thing as rhinitis rheumatica.

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*The Lancet, 1897, Vol. I., p. 572.

†Klinische Vortrage aus dem Gebiete der Otologie und Pharyngo-Lar. (Haug's) 1899.

In 1894 I described two varieties of this affection, viz.: one with visible changes in the nose, and the other without these. I must still adhere to this classification, but would add to the first category, viz.: cases with visible alterations in the nose; also such accompanied by changes on the outside of the nose, such as swellings and erythema multiforme of the nose, etc. The occurrence of the latter condition in these cases is not surprising, since it is well known that this eruption of the skin is in many respects analogous to the rheumatic angina, and it is strange that this has not been described before. At the same time, I believe that there are other eruptions of the skin of the nose which are due to rhinitis rheumatica, but I have had no occasion to observe them.

I shall now give you the details of some of my cases, and can do no better than to cite the first case described in my original paper.

Case 1. Mrs. X., about fifty-five years of age, came to me February 2, 1891. She complained of a cough, which was especially annoying in the evening, and of dryness in the throat. On examination I found a slight bronchitis, an atrophic condition of the nasal and pharyngeal mucosa, and an injection in the pharynx produced by the cough. I saw her twice, and then did not hear anything from her until she sent for me four weeks later. She told me that a few days before she had been stricken with one of her old attacks of articular rheumatism, the right knee and the larger joints of the upper extremities being affected. She had fever, which did not exceed 101° F. Her nose began to close up on the second day of this illness, and now it was entirely stopped up, so that she could not get any air through it. She had and still has headaches and pain in her nose, all of which together prevent her from sleeping. Externally nothing was seen except a slight redness of the whole nose; no swelling. On examination I did not find any part of the head sensitive to the touch, but as soon as I touched the nose, she felt pain. She experienced the same when I put my speculum into her nose, and I found that the alæ nasi were the most sensitive. They were not thickened, however, nor was anything else visible that was abnormal and could thus explain the pain in this part. The entrance of the nose was free, but further up the whole nose was clogged by a swelling which I thought to be the thickened mucous membrane. There was also present a grayish-white secretion, which both together filled almost the entire lumen of both nostrils. After removing the purulent discharge I applied cocain, but I found that even ten per cent. solution of it did not reduce the swelling at all. I gave her different medicines, but she did not feel easier on the second, nor the third day. On the fourth day only, after applying repeatedly a ten per cent. solution of cocain, could she breathe somewhat through the nose, but an hour later everything was closed up again. However, she began to improve after that day, and then menthol oil applied on a piece of cotton gave her some relief, so that she began to sleep during the night. At this time I could see very well that, after reducing the slight swelling of the mucosa of the septum with cocain, the lower and middle turbinated bodies were very much swollen. On touching them with a probe they felt hard. There was no sign of an abscess.

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*Compare Lewiston E. Shaw's article: "Cases of hemorrhage occurring during treatment by salicylate of soda." Guy's Hospital Reports, Vol. 44, p. 125, 1887 (Vol. 29 of the 3rd Series).

The fever lasted until the tenth day and then ceased entirely. From the fourteenth day on there was permanently a free passage for the air. The pains in the nose had been at times so severe that they could only be relieved by large doses of morphin. With the improvement in breathing, the pain in the nose grew less, until it gradually disappeared about the twentieth day of my treatment. At the same time her articular rheumatism had entirely left her and she felt well again, although still somewhat weak. I had given her salicylate of soda and salol, but it never struck me that her rheumatism had anything to do with the affection in the nose, although I could not as yet explain all the symptoms in this case. I saw her a week later in my office, when I found her nose almost in the same condition as on her very first visit: the mucous membrane atrophic, the size of the middle and lower turbinated nearly normal, surely not enlarged, and a perfectly free passage for the air. She left for a milder climate and I heard afterward that she felt well.

A year later, March 14, 1892, I was summoned again to the house of this lady. She had, after a very cold spell, again her rheumatism, and at the same time exactly the same symptoms of the nose as last year. She wanted relief for the latter, as she could easily stand the other pains. This attack took the same course as the one of the previous year. The swelling of the turbinated bodies disappeared about the fourteenth day, and with this almost simultaneously the affections in the joints of the extremities. She had the same pain in the nose and the same swelling and clogging. The last two winters the lady spent in Italy and I have not heard anything further about her.

I give now the histories of some of my later cases.

How difficult it often is to reach the correct diagnosis, the following case may be a proof:

Miss ——— consulted me first on June 11th, 1900, at the advice of her family physician, Dr. Emanuel Baruch. She had had some sort of an eczema on her face and body, and it seems that this extended, later on, to the nose. She consulted a dermatologist, who cauterized the introitus narium repeatedly without affording her the least relief. When she came to me she complained of obstructions in the right nasal cavity and of "terrible" headaches, especially on the right side. She also had pain in the ears.

On examination I found the introitus narium perfectly bare of all the vibrissæ, which had been diligently removed by the skin specialist, and many points of cicatrizations as evidence of his destructive work. There was, furthermore, an ecchondrosis of the septum narium on the left side, and hypertrophy of the right middle turbinal.

The ears were perfectly normal, although the patient also complained of pain in them. I gave her a mild salve for the nose. As the weather was hot, she soon went to the country, feeling apparently better.

In January, 1901, she consulted me again. All summer she had been perfectly well, but during the winter her old pain returned; in fact, more severely than before. She suffered from intense pains on the right side of her nose which radiated to the eyeball, the ear, in fact the whole head and body. These "neuralgic pains" were so violent that she could not attend to her vocation. This time I found a very pronounced congestion in the right nasal cavity, the left one showing the same appearance as before. As there were no distinct causes for this nasal pain to be found, the accessory sinuses being perfectly normal (no discharge), eyes and ears normal too, I began questioning for other symptoms, and elicited that she had been a sufferer from rheumatism for a long time. Indeed, it is remarkable that none of the specialists previously consulted had placed her on anti-rheumatic treatment—lucus a non lucendo! After reaching this diagnosis, I ordered hot baths and vinum colchici, t. i. d., 20 drops. Within three day she returned, much worse. After the first hot bath, she had left her window open and during a very windy night had caught fresh cold. After this had subsided she took 40 drops of vin. colchici, t. i. d., and now feels like a new person. She has had no trouble since, as she takes her medicine as soon as premonitory symptoms appear.

In studying this case, we note that we have to deal with an exudative inflammation of the right side of the nose, which affected not only the neighboring parts of the face but, besides, indirectly involved the whole system. Whether the rheumatism attacked the nose first is difficult to decide, as the beginning of this history is somewhat obscure. However, it seems quite rational to believe that her nasal trouble of a year ago was of a rheumatic character. The patient felt better as soon as the warm weather set in. That perhaps the nose was the primary seat of the rheumatic affection I am inclined to believe. We have analogous conditions in other parts of the upper air tract. We know that the pharynx, especially the tonsils, are frequently the seat of a primary infection, and not only of rheumatic, but of other nature. I need mention here only measles, scarlet fever, etc., in which the primary angina is a well known factor. We further know that the retropharynx is often the portal of the infection in tuberculosis, and I take the liberty of drawing your attention to my own investigations in this direction, which were published in 1896 and 1897. Perhaps the nose is still more often the locus minoris resistentiæ. But the fact is that germs and other foreign bodies which come in contact with the mucous membrane of the nose can be eliminated much more readily from this part than from the retropharynx. In the above case, perhaps a weak point was created by the constant unnecessary manipulations, such as cauterizing, epilations, etc., and through this the rheumatic virus found its entrance. Whether this was really so, is hard to prove. The fact is that here we have a typical case of rhinitis rheumatica, which promptly yielded to the proper treatment, thus relieving the patient of a great deal of pain and annoyance. (Parenthetically, I would like to mention that the eczema of the face and meatus narium was the first symptom, and not until later did the pain in the nose appear.)

The following cases are typical for certain distinct classes of the disease:

Case 3. L. T., 34 years of age, banker, is of athletic build and generally enjoys good health. He has had pains in the nose and along the supraorbital nerve, and a profuse discharge from the nose for the last four years in winter, whenever there are north or east winds. He has consulted many specialists in this city, but without any satisfaction. As he came to me during an interval, I could find nothing pathologic in his nose and retropharynx. I suspected, however, rheumatism and told him so. The next time he came there was a marked congestion and swelling all over the nasal mucous membrane; more so on the left side. He was just in an attack.

How is it that east and north winds affect him? The explanation is very simple. He is rheumatic, as I soon discovered. When we have east winds we have rain and snow and an abundance of moisture in the air, which produce a chilling of the body, and easily brings on rheumatism. The north winds have to travel over many miles of snow before they reach us, and besides carrying along a great deal of moisture, also bring very cold weather, a still more important factor in our cases. When south winds prevail the patient feels well, and that is quite easily understood, in view of the warm currents of air they transmit.

Case 4. Ida S., twenty-three years old, a native of Hungary, entered the Montefiore five years ago, previous to which time she had been a domestic. Her mother died of phthisis. The patient has always been sickly, but gives no history of rheumatism except that the limbs were swollen three years ago. Menstruation began at fifteen and was always irregular. During last summer it ceased completely, and is scanty now. Last summer she had an attack of hemiplegia with loss of speech, and a brief period of unconsciousness. She complains at present of occasional pains in the limbs when the weather changes. Palpitation of the heart occurs on slight exertion. Occasional swelling of the feet present; appetite is poor, the bowels irregular, and rectal pains are experienced during a movement. Status præsens: The patient is pale, and has a slight icteric hue. She sweats easily. The mucous membranes are anemic; the feet slightly edematous; pes planus. The heart action is irregular; at the apex there are soft blowing systolic and diastolic murmurs; at the orifices the sounds are comparatively clear. The pulse is 96, small, soft and intermittent at times. The tongue is thickly coated. The patient, who is very tall, weighs 126 pounds.

On examination there was seen on the outside of the nose, and and more particularly on the left side, a redness occupying especially the middle part of the nose. This area is sensitive to the touch. Anterior rhinoscopy shows somewhat enlarged nasal passages, which are lined with a dark reddish, non-hypertrophic mucous membrane. This is especially sensitive to the touch in the vicinity of the middle turbinal, corresponding to a similar place on the exterior of the nose.

I ordered salicylate of soda which she was able to take in quite large doses, and soon she felt better. On stopping the salicylate the pains rapidly returned, especially as the weather continued cold. We, therefore, kept her for weeks under gradually diminishing doses of salicylate of soda, and have discontinued it now entirely, the patient being completely free from pain.

It is beyond doubt that here too we had to deal with one of the cases of rheumatism of the nose (rhinitis rheumatica), which are so very rare and which promptly improve, as soon as they are treated correctly. There are some cases, however, which I had not seen before, and which exhibit often more marked changes on the outer part of the nose. At the same time it is interesting to watch how the conditions within the nose alternate under the change of the weather, medication, etc.

Mr. A. N., thirty years of age, electrician, has had "catarrh" for over a year, which did not annoy him much. Of late, however, he has noticed a swelling on the exterior of his nose, which made it appear quite ugly. Besides this, he often complains of pain in the nose.

On inspection, May 7th, 1900, a swelling on the dorsum nasi, more toward the right, was distinctly seen. It felt hard to the touch. Corresponding to this was a hypertrophy of the right middle turbinal. On all the parts the nasal mucous membrane looked pale and atrophic. I treated him with indifferent remedies, as I was not quite certain about the diagnosis. May 10th: It was raining all day yesterday and to-day and he feels more pain. The swelling on the dorsum nasi very sensitive to the touch. The middle turbinal is more swollen and very much congested, while the other parts of the mucous membrane look pale. This contrast is especially noticeable when we compare it with the healthy, i. e., the left side, of the nose, where the whole mucous membrane shows an extraordinarily pale color; patient complains of "feeling tired all over."

May 17th: He had received anti-rheumatic treatment and has no pain now. That "tired feeling" is gone too, but he "don't know whether the medicine did it." There is very little to be seen of the swelling on the outside of the nose and this disappeared, as I want to say right here, within the next three weeks entirely, never to return (this after a period of almost two years). However, the pain and the swelling of the right middle turbinal within the nose returned several times, while the patient was under my observation. This was generally the case when the weather was inclement. I heard recently that the patient is well, with occasional attacks of rheumatism, but have not seen him for six months.

I have two more cases on record, which are, in their essential points, very similar to the one just narrated. In these two cases the rheumatic arthritis was very pronounced, and it was repeatedly observed that the pains in the joints were preceded by exacerbations in the turbinated bodies of the nose, which at such times usually showed a marked hyperemia and congestion. Similar conditions have been reported of late from the clinic of Prof. Senator of Berlin, by Dr. Menzer.*

If we now ask what constitutes rheumatism, we will see that the opinions differ widely. "It can be plausibly argued that many distinct diseases are included under the term, while, on the other hand, it can be just as reasonably urged that rheumatism includes all bacterial infections—having a simple myalgia at one extreme and pyemia at the other."†

I should like to draw your attention here to a paper by Drs. Boynton and Paine.‡ According to them, most writers attribute rheumatic fever to an infection with a diplococcus. Others assume a specific anerobic bacillus; still others believe that it is due to an invasion of streptococci and staphylococci. Boynton and Paine found in eighteen cases the diplococcus regularly present, so that the name of "diplococcus rheumaticus" seems to them justified. There is no doubt that this diplococcus has been found by other competent observers as well. But does this mean that it is really the cause of rheumatism? I think not. At least, recent experiments do not seem to speak in favor of such a theory. Thus, for example, Menzer§ made cultures of streptococci from a case of undoubted septic infection. After inoculating them on guinea pigs, very pronounced multiple exudations in the joints were produced. This proves that streptococci from a typical septic infection have a specific predilection for the joints, even where there were no symptoms of an arthritic lesion present in the person from whom the cultures were taken.

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*Berlin Klin. Wochenschr., p. 40, 1901.

†H. W. Loeb. in an editorial, St. Louis Med. Review, Oct. 12, 1901.

‡British Med. Jour., Sept. 21, 1901.

§"Ueber Angina, Gelenkrheumatismus, Erythema Nodosum, Etc." Berlin. Klin. Wochenschr., p. 10, 1902.

The question concerning the origin of infectious diseases, may they be what they may, cannot be solved from a bacteriologic standpoint alone. We have to consider the whole human system, its constitution at different ages, and how it reacts under varying conditions to the invasion of the ubiquitous bacteria (Menzer). You all know that, under perfectly normal conditions, there are found in the nose, in the retropharynx, on the tonsils, etc., a host of pyogenic bacteria that do no harm to their possessor. As soon, however, as the equilibrium of an organ is destroyed by any cause, these bacteria will proliferate, and perhaps by a mere chance one species or another will predominate. We have no right, therefore, as I believe, to call any coccus the specific organism of rheumatism. Supposing a number of people attend a ball, and are suddenly exposed to the cold winter air. One reacts with an acute coryza, another with an angina, the third with bronchitis, the fourth with pneumonia and the fifth with rheumatism. Are we then to believe, says Menzer,* that the one person inhaled the infectious bacterium of coryza and the others those of angina, bronchitis, pneumonia or rheumatism? Is the idea not much more plausible that different individuals, according to their constitutions and habits, are affected differently by external influences?

Be this as it may, I will not discuss this highly interesting and important part of our question any longer. Allow me to say that, whatever the cause of rheumatism may be, it shows itself in the nose as well as in other parts of the human organism, and appears both as an acute and chronic affection. In conclusion, I would ask you to be on the lookout for such cases in your practice, and trust that my observations, as well as those of Sendziak, will aid you to some extent, at least, in recognizing this condition, and thus enable you to more readily effect a cure.

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*l. c., p. 34.

XI.

REPORT OF A CASE OF TEMPORO-SPHENOIDAL ABSCESS, WITH PRESENTATION OF PATIENT.*

By James F. McKernon, M. D.,

NEW YORK.

AURAL SURGEON TO THE NEW YORK EYE AND EAR INFIRMARY.

This case is reported, not because there is anything particularly unusual in its history, but on account of one point in its mode of development, and because I believe every case of brain abscess operated upon, whether successful or fatal, should be reported, as, many times, we can learn quite as much, if not more, from a fatal case as from a successful one.

The history of this case is, briefly, as follows:

J. L., boy, nine years of age, was brought to my service at the hospital in March, 1901. His parents, who accompanied him, gave this history: He had had measles when three years old, followed by a running from the left ear, which up to the present time had never entirely ceased except for a few days at a time.

Fourteen months ago he had complained of severe pain in the left ear, after taking cold; for several days following this, the ear discharged very freely, and about ten days after the pain began in the ear he complained of pain behind the ear, over the mastoid. This was followed, four days later, by a swelling about the size of a small egg over the mastoid process.

He was seen at this time by a physician, who made an incision through this swelling and evacuated quite a quantity of pus.

After this the boy improved, the swelling back of the ear subsided, and in a few weeks he was apparently as well as ever, except for a slight discharge coming from a depression over the lower portion of the mastoid, where the swelling had existed, and a more or less continual discharge from the auditory canal of that side.

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*Read at the meeting of the Eastern Section of the American Laryngological, Rhinological and Otological Society, New York City, March 1st, 1902.

Six months ago he began complaining of headache over the whole of the left side of the head—would occasionally be sick at his stomach, refuse to eat, and was very irritable. At times during the night, while asleep, he would suddenly start and scream as if in pain; and upon being awakened was not conscious that he had made any disturbance.

About a month ago the head pain became so severe that he could not sleep except at intervals each night. He would refuse food, and when he did take his food would frequently vomit it. He became very pale, unusually fretful, and had lost some fifteen or sixteen pounds in weight.

The discharge from the auditory canal and the opening behind the ear would almost entirely cease for several days and then would suddenly reappear, and was of a very foul odor.

At the times when the discharge would cease the headache was always more distressing.

Five days ago he vomited, became very drowsy, would not answer when spoken to, complained of intense pain on the left side of his head, and when aroused for food or asked questions, he would mispronounce words and call articles by wrong names.

This condition has continued till the present time.

Physical Examination.—Physical examination showed a boy looking scarcely six years of age, emaciated, with pale septic look, drowsy and inclined to sleep in his mother's arms; tongue dry and glazed, skin dry and yellowish, pupils unequal, with a temperature of 99.2, pulse 68, respiration 16.

It was almost impossible to rouse the child, and when this was done he would refuse to answer questions, place his hand over the left side of his head, and, with a low moan or whine, would drop off into a state of coma again.

Examination of the ears disclosed on the left side a rather profuse greenish discharge, with an extremely foul odor, coming from the canal. Upon wiping this discharge away and inspecting the deeper portions of the canal, it was seen that there was almost complete destruction of the drum membrane; and a soft polypoid mass, resting partially on the inner wall of the tympanum and partially on the floor of the canal, was discovered. This mass had its origin in the upper and posterior part of the vault.

Examination of the mastoid showed a depression about half an inch from the tip, and from this depression a thin serous discharge came, having a markedly unpleasant odor.

The child was in such a state of profound coma that pressure over the mastoid or percussion over the left side of the head did not seem to disturb him in the slightest degree.

The eyes were examined; the left pupil was slightly contracted, there was choked disc, and hemorrhage throughout the retina. The right eye was normal.

A diagnosis of brain abscess was made, and an immediate operation advised. The urine was examined and found to contain rather a large quantity of albumin.

OPERATION.—The patient was prepared for operation, chloroform administered; the polypoid mass, together with portions of the malleus and incus, was removed, and the middle ear thoroughly cleared out; a probe was then passed through the sinus over the mastoid, and came in contact with roughened, uneven areas of bone. The mastoid was exposed in the usual way, and a thin, creamy discharge found throughout.

Communication was established between the antrum and middle ear; the bone forming the roof of the antrum and floor of the middle fossa was removed with the forceps, and here the dura looked perfectly normal. Continuing the incision forward in the soft parts so as to expose the bone directly over the tegmen tympani, the bone was then removed completely across the floor of the middle fossa, beginning at the point where it had been stopped to prepare the flap. After a small area of bone directly over the tegmen had been removed, the dura was found to be darkened in color, the discoloration seeming to extend upward and inward. The bone was removed in this region about as large as a fifty cent piece, and everywhere the dura looked unhealthy, and just above the center of the opening was somewhat softer than any other portion. A transverse slit was made in the dura at this point with a knife, the dura retracted, and a puncture about an inch in depth was made with a knife in the brain substance. This was followed by a discharge of very foul smelling, greenish yellow pus. The finger was passed into this opening, and more pus and broken down brain substance was evacuated. Blunt retractors were used to separate the abscess walls and to allow as thorough an evacuation as possible. The cavity was then gently irrigated with a hot normal salt solution, and only enough used to thoroughly wash out the cavity. A strip of plain sterilized gauze was rolled in the form of a wick, this moistened with a salt solution, and in turn rolled in a powder composed of equal parts of boric acid and iodoform. The wick was then carried down to the bottom of the abscess cavity, and the cavity very loosely packed so as to allow as complete a collapse as possible of the abscess walls.

The flap in the soft tissue was drawn backward and sutured up to the point of drainage from the cavity. The usual dressing was then applied, and, as the patient's condition was not good, direct transfusion was done with a normal salt solution.

From this time on the patient made an uninterrupted recovery. The first dressing was removed at the end of four days, and very little discharge was found; the cavity was gently irrigated with a warm solution, and packed loosely as before.

At the end of 18 days the brain cavity had entirely closed, and on the 24th day after the operation the boy was discharged from the hospital to return twice a week for the mastoid dressings. The mastoid wound was rather slow in healing, and as you will see upon examining the the patient, has left quite a large permanent depression corresponding to the antrum, which will later be closed in by plastic operation.

The discharge from the external auditory canal ceased after the first week.

The aphasia persisted for only 5 days after operation; the pupil quickly resumed its normal appearance, and at the time of his discharge from the hospital there was only a faint trace of albumin present in the urine.

His hearing at the present time, on the affected side, is for the whisper 12 feet.

I have many times spoken against the custom, formerly so much in vogue, of performing a Wilde's incision (in this class of cases or, in fact, any other) as was done in this case; and the report of this case is as much to reiterate my protest against this method of treatment as it is merely to report a successful case; for had a radical operation been done upon the mastoid at the time the Wilde's incision was made, it is safe, I think, to say that this little patient would have been saved months of suffering, besides avoiding any cerebral complications and subsequent danger to life.

Another point, and one I believe to be of vast importance is that, when cases of chronic purulent otitis media come under our observation, we should examine the case carefully to determine the presence or absence of intratympanic caries, and if caries be present, its removal should be advised at once so as to prevent the possibility of any subsequent intracranial infection taking place.

XII.

LEUKOPLAKIA BUCCALIS, WITH REPORT OF CASE TREATED WITH X-RAYS.*

By Otto J. Stein, M. D.,

Chicago.

In the presentation of cases before our important medical gatherings or in the recital of such cases in the medical press, it has become almost a universal practice for us to elucidate such cases as reflect the greatest credit upon our personal skill or upon some special method employed or particular remedy used; hence it seems as if one is about to break one of the sacred precepts of our great institution by being so indiscreet as to inflict upon the already over-burdened practitioner the story of a failure in treatment. But such is my mission to-day. Perhaps my first motive in making a report of this case before this body is the interest the entire civilized world has of late taken in the therapeutic value of the X-rays. We, as nose and throat specialists, are particularly interested in this new branch of diagnostic and therapeutic medicine, because it holds out to us some hopes in facilitating our means of clearing up doubtful diagnoses, and possibly a means of treating some of our almost inaccessible and so-called inoperable pathologic conditions.

In presenting the history of this case to you, I am fully cognizant of the fact that "one spring does not make a river;" but at the same time I cannot help recognizing the importance of the effect of the X-ray treatment in this particular case and the influence it might bear upon subsequent cases in your and my practice. As far as I have been able to ascertain by a casual perusal of the literature, I have not found any record of a similar case treated in this particular manner. In brief the case is as follows:

P. N., aged 54 years, of Norway, and a steam-fitter by trade, presented himself for treatment October 21, 1901. Nine months prior to this he first noticed a soreness on the inner aspect of the left cheek. Several small white areas were at the same time noticed by the patient, located at the place where the soreness was felt. Three months prior to my seeing him he had a piece of the affected mucous membrane removed, the size of one's finger nail. The scar may be distinctly seen now. At the time of my seeing him, one saw a thickened, hornified, somewhat wart-like appearance of the mucous membrane of the inner left cheek, just in front of the ramus of the lower jaw and about half the size of a little finger nail. Its surface was rough and somewhat pitted, of a pearly white appearance, tough and firm to the touch, very adherent, bleeding readily on free manipulation, and somewhat painful to touch and when eating. More forwardly located toward the angle of the mouth, and on both sides, were seen a number of milk-like, irregular patches; some of them whiter and thicker than others, showing their raised character. These were not sensitive in any way.

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*Read before the Middle Section of American Laryngological, Otological and Rhinological Society at St. Louis, Mo., Feb. 22, 1902.

Slight enlargement of a few of the lympatics on the left side of the neck could be made out. The patient strenuously denies any history whatever of syphilis. Nevertheless he was put on increasing doses of iodid of potash and mercury and at the same time local applications of aniline were instituted. Six weeks of this treatment showed, in place of improvement, a steady, although very slow progression of the trouble. The area of hornified membrane seen on first examination was exsected and subjected to a careful scrutiny by the microscope, the Zeit Pathological Laboratory reporting the specimen to be an epithelioma. At this time I presented the patient to the Chicago Laryngological Society, promising to make a later report after institution of further treatment. The patient being averse to anything of a radical surgical nature, I suggested his trying the application of the X-rays. To this he readily assented, and through the kindness and courtesy of Dr. William Allen Pusey, of Chicago, he immediately commenced a course of treatment by means of the X-rays. It is now eight weeks since this form of treatment has been employed, consisting of daily exposure to the rays for a period of 15 minutes. The rays are collected and conveyed to the affected area by means of a funnel made of tin, about 6 inches long and 3-4 inch in diameter at its distal end, inserted in a plate of lead which covers the face. I have seen the patient several times since this form of treatment has been in progress. The appearance of the trouble as seen only a few days ago is as follows:

Where the small-sized, white, hornified and raised area was at first, we now have one the size of a thumb nail or larger, which is very painful to the touch. Anterior to this, where we saw the milk-white patches, is to be seen ulceration of the mucosa, showing a tendency to running together. At places, the ulcerations have healed, but again the mucous membrane is raw and angry-looking, and exceedingly painful. On the right side the milk-like patches are still to be seen, but no further trouble. Along the gingival margin of the lower jaw and in front, also almost the entire inner aspect of the lower lip shows the formation of these pearly-white patches known under the name of leukoplakia.

A very few remarks on the subject of leukoplakia buccalis may be sufficiently pertinent to the case reported, to merit your indulgence for a few minutes more. The condition is highly important on account of its almost insignificant appearance, with very nearly total absence of subjective symptoms, but frequently progressing before its recognition to a state of malignancy with fatal termination. The disease is known under a variety of names, but leukoplakia is best expressive of its general appearance and hence the most acceptable term to use. On account of its non-expressive appearance, the dentist is perhaps the one who first sees and recognizes the condition.

A thin and sensitive mucous membrane has been suggested as a predisposing factor, which under the proper irritative influence is productive of the disease. Amongst the irritating influences are recognized tobacco smoking and chewing, alcoholic drinking, very hot and spiced food, neglected teeth and syphilis. It was formerly thought that the disease was a mucous membrane manifestation of some form of skin disease, as psoriasis, herpes and lichen planus.

The appearance of the disease as usually first recognized is that of pearly-white or milk-white irregular plaques or patches of varying size, smooth and glistening, causing no discomfort whatsoever, appearing anywhere on the mucous membrane of the cheeks, lips, gums, tongue, palate and fauces. Later they become more thickened and hence elevated. Also more hardened, until they may present a rough and pitted surface, hornified to the feel and markedly elevated. Either one of these two conditions may begin to fissure and finally ulcerate, resulting in a very painful affection.

In the case reported to you the three pathologic conditions were present, *i. e.*, milk-white patches, hornification (ichthyosis) and ulceration. It was the hornified membrane in this case that showed an epitheliomatous structure under the microscope. It is my opinion, based on the few cases I have seen, four in number, that neither age, sex, nor syphilis are necessary factors in the production of the disease; that there is always a tendency to malignancy, and, finally, that predisposition plays an important role in its production.

Mindful of the fact that the whole medical world has been carefully watching the results of the application of light rays in the treatment of various diseases, and at the same time conversant with the brilliant work done in the relief and cure of such conditions as lupus and carcinoma of the skin, I fostered the gleam of hope I entertained that the same success might be achieved for affections within the mucous cavities of the head, as was so brilliantly being obtained on the surface of the body. With this hope I suggested to our patient the X-rays as a possible means of relief from his terrible disease.

XIII.

TREATMENT OF KERATOSIS OF THE FAUCES.

By Charles W. Richardson, M. D.,

WASHINGTON.

In the consideration of this subject, it is not my intention to go into the subject of its pathology any further than is necessary to explain the reason of the failure of many lines of treatment that have been instituted for this condition, and the suggestion of the only course of treatment which seems to be attended with any restful issue.

Beginning with the observations of Heryng, Colins, and Garel that, in mycosis of the pharynx, there were certain submucous and epithelial changes in the tissue affected, and the excellent article by Siebenmann, in which he describes so throughly his pathologic finds, which have been substantiated by Brown-Kelly and Kyle, there seems to be an accumulation of evidence to the fact that all cases of so-called mycosis of the pharynx are not mycotic affections, but frequently changes in the sub-mucosa and epithelial layers of the parts affected, produced through influences not yet clearly defined.

My investigations upon this subject accord most thoroughly with those of Siebenmann, Brown-Kelly, and Kyle. In none of the cases which we have examined has the leptothrix been found, although most of the specimens have been those of sections of the tonsils. Further, as to the bacteriologic investigation, I cannot go, as we feel that, at the present writing, our material is not abundant enough to warrant conclusions.

From the investigation of the authors above mentioned, and from my own studies of this condition, it seems to me that the chronic condition which is so often recognized as mycosis of the pharynx is, in the majority of cases, a keratosis; also, that, when the leptothrix is present, it occurs mostly as an accidental deposit upon the keratoid quills. There is no doubt that there is a condition due to the action of the leptothrix, present more frequently in the buccal, and occasionally in the pharyngeal cavity, but more acute in its type and entirely different in its clinical and microscopic appearances from the disease under consideration.

In considering the treatment of this affection, it must be well borne in mind that the alteration in the mucosa seems to cause no alteration in the general physical welfare of the patient; that the local symptoms are very mild, a sensation of pricking, stiffness, or fullness, being noticed in the throat; and that the disease has a tendency to a spontaneous recovery in a period ranging from six months to several years. Most frequently, after some days of abnormal sensation in the throat, the patient, or his friends, discover the characteristic tufts on the tonsils or pharyngeal wall. It was this discovery which caused him to consult a physician. If it were not that most persons were irrational with regard to their physical conditions, and that the psychic influence from the mild local irritation would be deleterious, I should suggest that no local treatment be instituted.

The demand is usual for the removal of the "spots," and this as rapidly and thoroughly as possible. The general condition of the patient should be carefully gone over, and, if any impairment of the functional activity of any system or organ, is noticed, these should be corrected. Most frequently there will be found more or less disturbance of the gastro-intestinal tract, and treatment should be suggested to correct the disordered digestion. For the local treatment, various medicinal agents, such as the astringents, alteratives, chemical cauterizants, and antiseptics have been suggested. The use of these agents has been suggested through the accepted dictum that the disease is solely due to the activity of the leptothrix buccalis. If this parasite were the sole cause, it would seem that the application of more active antiseptic solution should bring about a thorough and quick resolution. The numbers of these agents suggested would indicate their failure to produce the desired result, and such is the apparently accepted view. Even should the changes in the mucosa be due to the action of the leptothrix, the changes in the structure through the cornification of the epithelium would prevent the absorption of sufficient of the solution to produce any action on the deep seated threads. Most workers who have had any experience in the treatment of this affection are agreed that only the thorough and deep seated removal of the diseased tissue is attended with any permanent result. When the quills, or tufts, are situated upon a tonsil, the tonsil should be excised as thoroughly as possible with the tonsillotome, scissors, or tonsillar punch. Those quills which cannot be removed in this manner, when situated upon the tonsil, or where-ever else located, should be attacked with the galvano-cautery. Each quill, or tuft, should be separately attacked, and it, as well as the adjacent tissue, destroyed well down into the sub-mucosa. Frequent and recurring use of the cautery will be necessary in order to bring about resolution. Usually within a period of four weeks the most obstinate cases will yield to this method of treatment. The reason why this method of treatment is successful is that we destroy the matrix, if I may use such a term, which seems to be the sub-mucosa, from which these tufts seem to bud forth.

XIV.

THE ETIOLOGY OF DEFORMITIES AND DEVIATIONS OF THE NASAL SEPTUM.*

By William Lincoln Ballenger, M. D.,

CHICAGO.

So much has been written upon this subject that I will not attempt to review the literature, but will take the more commonly accepted theories and briefly discuss their merits.

W. J. Freeman says: "The chief cause of deviations, and probably of many other deformities of the septum, is the lack of development of the hard palate. Trendelenburg was, perhaps, the first to associate the high-arched palate with deformity of the septum, but did not, so far as I can learn, consider it due to a lack of development of the maxillary bones. Loewy expresses somewhat the same idea, but regards the Gothic or high-arched palate as of rachitic origin. Zuckerkandl rather scouts this idea of Loewy, and says he has been unable to associate rickets with deviated septa, and that it is chiefly the lower jaw, not the upper, which exhibits a rachitic influence.

"On the other hand, it is the every-day experience of us (Freeman) all to find the high-arched palate associated with a deviated or otherwise deformed septum. Thus, in 302 cases of high-arched palate I have examined lately, there were twelve only where there was no marked deformity of the septum. Here, then, we have 96 per cent. of deformed septa, which shows that there is undoubtedly a very close relationship between the high arch and septal deformities. One must not, however, in drawing conclusions as to the relationship between the Gothic-arched palate and deformities of the septum, consider that every high arch is an abnormal one. In studying the skulls in the Mütter collection, I found that a perfectly straight septum was not commonly associated with a high arch. This, however, was chiefly in dolichocephalic heads in which, with the high, narrow skull, there was associated a high hard-palate and, in spite of the latter's position, the choanæ were also very high and narrow. I would add, however, that the skulls were those of non-Europeans, in whom, as Zuckerkandl has pointed out, one finds deformities of the septum much more infrequent than with us. As we have seen above, the infant hard palate is of the Gothic type, and anything which interferes with the skull and perfect development of the child prevents also the development of the hard palate and, consequently, its descent. Indeed, as years go by, the Gothic arch becomes more and more peaked by the further development of the aveolar processes and the eruption of the teeth. On account of the high position of the palate, the septum must bend or twist, accommodating itself to the boundaries imposed by the unyielding framework of the bones with which it articulates. Another point in favor of this view is that mentioned by Welcker, that in some cases there is a descent of one of the superior maxillary bones, the other remaining high-arched, in which case the convexity of the deviation is toward the lower."

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*Read before the meeting of the Middle Section of the American Laryngological, Rhinological and Otological Society, Feb. 22, 1902.

Eugene S. Talbot* has written more extensively and carried on a wider range of observations regarding deformities of the facial bones, including those of the nose, than perhaps any other investigator. His views are briefly presented in the following quotation:

"Morgagni believed they were due to excessive development of the vomer. Trendelenburg held that they were due to a crowding up of the high-arched plate, as he had observed the two conditions frequently connected. Jarvis has reported four cases, all in the same family, and suggests that they are due to direct hereditary defect; while neurotic or degenerate conditions which underlie the building up of the system may produce the deflection, direct hereditary here, as elsewhere, is rare. Schaus and Welcker's investigations show there is a faulty development of the facial skeleton. Bosworth and others believe that septal deformities are due to traumatism.

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*"Irregularities of the Teeth," pp. 175, 195 and 196.

According to Bosworth,* "The clinical history of many of these cases affords direct evidence of this, and even in those cases in which the direct injury is not testified to, I think it safe to say that an injury has occurred, which may have been of so slight a character as not to have excited especial attention at the time of the occurrence. An injury to the nose need not necessarily give rise to the immediate development of a notable deformity, as in fractures, but it may set up a low grade of morbid action, which, going on through a number of years, will finally develop a condition by which the normal function of the nose is seriously hampered. The point on which I would lay especial emphasis is that the deformity is primarily the result of traumatism and secondarily of a slow inflammatory process which results therefrom."

Talbot continues: "Deviation of the nasal septum to one side or the other is the result of an unequal development of adjacent bony parts, more especially and directly of that of the turbinated bones. It depends largely, if not exclusively, upon the development and position of these latter. They, in turn, are dependent in great measure upon the development of the facial bones, which are modified as the facial angle increases and prognathism is lost, the turbinated bones being, as it were, exostosed, not molded in many directions by adjacent parts, encroaching more irregularly upon the nasal cavity, as their origins are disturbed or dislocated. Freedom of these nasal passages for transit of respired air is essential. In normal respiration the tendency is for both nostrils to share equally. The natural consequence is that the vomer, the ossification of which is incomplete until puberty, is deflected and occupies, as a rule, nearly a midway position between the bony prominences on either side. Deflection of the septum, hence, is a compensatory arrangement for the evolutionary variations of facial development. It is, therefore, most frequent in the higher races, while in the lower its occurrence is markedly less.

"Instability of tissue-building is to be expected in neurotics and degenerates. It is easy to see how, with such an unstable bone tissue to build upon, the mucous membrane of the nose can take on atrophy, hypertrophy and adenoid growths, resulting in mouth-breathing.

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*Diseases of the Nose and Throat.

"Total collapse of the outer walls of the nose is frequently observed among neurotics and degenerates. This is associated with arrest of development of the bones of the face, jaws, deformities of the dental arch, weak contracted chest, round-shoulders, husky voice, etc. In most cases of this description the nose is very long and thin. The nasal bones are excessively developed and arrested, with marked deflection of the septum. Frequently nasal catarrh is present. When the patient attempts to inhale air the outer walls are brought together and nose-breathing is impossible."

An analysis of the foregoing quotations, from Freeman and Talbot, gives an epitome of the theories that have been advanced and defended as to etiology of deformities of the nasal septum. These theories may be tabulated as follows:

1. Morgagni thought they were due to excessive development of the vomer; the vomer crowding upward against the descending perpendicular plate of the ethmoid causes them to deflect to one side in order to allow of their continued development.

2. Trendelenburg and Freeman think the chief cause of the deflection is in the persistent high or Gothic arch of the hard palate. The vomer and perpendicular plate of the ethmoid are thereby crowded, and deflect in order to find room for further complete development.

3. Jarvis believes the cause is heredity and quotes observations in support of this theory.

4. Schaus and Welcker advance the hypothesis of a faulty development of the facial bones, including those of the nose.

5. Bosworth argues that traumatism is the chief cause of deflections.

6. Talbot takes the theory of Schaus and Welcker and carries it still further back and says malformations of the septum are due to neuroses or stigmata of degeneracy, which result in irregular development of the facial bones. He believes that the pigeon chest, adenoids and deformed nasal septa are all due to the same neurotic influences,

which arrest development in some parts while in others there is an increase in the development of the parts.

It is difficult to arrive at a final conclusion concerning these theories, as data of almost any kind can be found by one who diligently searches for it. It is easy to say there is excessive development of the vomer, and to report so many thousands of observations on skulls in which this theory is substantiated. Trendelenburg and Freeman have satisfied themselves that the Gothic arch is the cause. They say the high arch of childhood does not descend as it should and that the space for the vomer and ethmoid plate is thereby encroached upon and deflection results. Talbot and others have studied the so-called high arch and find it rarely exists; that in some instances there is lack of lateral development of the superior maxilla which gives rise to the Gothic arch, or what appears to be an abnormally high arch. Actual measurements show them to be no higher than normal. Then, too, Talbot claims many hard palates which are lower than the average are attended by septal deformities. He does not deny that traumatism does in some instances account for septal deformities, but he does deny that it is the chief cause of deviations. He believes that consanguineous marriages predispose to the neuroses, and that facial deformities result therefrom. He holds that the facial bones are transitory, more subject to developmental influences than most parts of the skeleton, hence are either arrested or over-developed in those tainted with the stigmata of degeneracy.

Dr. Talbot's views present the most rational explanation of this much mooted question that has yet been offered. He does not name the over-development of a particular bone, nor does he claim the failure of the palatine arch (roof of the mouth) to descend as being the cause of deviations of the septum. If these conditions are present he claims they are incidental signs of a neurosis or degeneracy. The factor back of an excessive development of the vomer, or of a Gothic or narrow (not high), arched palate, is also back of the deformed septum.

In conclusion, I will epitomize the etiology of deformities of the nasal septum as follows in the order of importance:

a. Neuroses or stigmata of degeneracy which cause either an arrest or an excessive development of the bones of the face including the nose, one of the expressions of the neuroses being deformed septa. (Talbot.)

The theories of Trendelenburg, Freeman, Morgagni, Jarvis, Schaus and Welcker are swallowed up in that of Talbot. The individual theories they advance but imperfectly convey the true explanation, while Talbot's comprehends them all and strikes at the root of the matter.

b. Bosworth's traumatic hypothesis is true as to a certain number of cases. That it explains a majority or even a large per cent. of them is doubtful.

The phraseology used by Talbot may be objectionable inasmuch as it assumes that there are "stigmata of degeneracy" present in all cases not due to traumatism. It would be better, perhaps, to say that deflections of the septum are usually due to an incoördination in the development of bones of the face, including those of the nose.

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XV.

ESSENTIALS IN THE TREATMENT OF LARYNGEAL TUBERCULOSIS.*

By Robert Levy, M. D.,

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Notwithstanding the vast amount of literature on laryngeal tuberculosis constantly appearing, our interest in this subject is in no degree lessened. The study of this disease is still in its infancy and as methods of treatment one after another are presented to us, the maze in which we find ourselves becomes more and more bewildering. We seem to be groping largely in the dark and the more cases one sees the more he is impressed with the importance of attempting a solution which shall offer more definite guidance for the treatment of this important and distressing affection.

Colorado has for years been very attractive to patients suffering from tuberculosis in all its forms, and those of us who have practiced there for any length of time have enjoyed special advantages for study and investigation. Unfortunately the more cases we see the more confusing and unsettled becomes our point of view, and it was with a feeling of joyful anticipation that I began reading the article by St. Clair Thompson, entitled "The Principles of Treatment of Tuberculosis," which was presented to the British Congress on Tuberculosis in July, 1901. It seemed by the title that the paper was an extremely timely one, but I confess my disappointment in it. The paper lacks that definiteness which we need in the practical handling of our cases, besides its general tone is decidedly discouraging to all local treatment. It is, however, not without a great deal of value and one will do well to study it carefully for there is much help to be derived from its perusal.

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*Read at the meeting of the Middle Section of the American L. R. and O. Society, St. Louis, Feb. 22, 1902.

It is extremely difficult to outline a plan of action in the management of laryngeal tuberculosis, because of the great variety of pathologic conditions which are met with from the incipiency of the affection to its last stages. It seems to me unwise to accept or to condemn any line of treatment unconditionally, for we should bear in mind that each case and each stage of the affection needs individualizing. Local as well as hygienic and general treatment should be applied to each case as the occasion demands. It is never too early to treat these cases, nor is it ever too late to administer to their suffering.

So conservative a man as Schech in Heymann's Handbuch puts it very strongly, that no matter in what extremity the case presents itself, it becomes our duty to apply that which our science and art has taught us. When about ten years ago, Heryng and Krause advocated so strenuously the surgical treatment of this affection, the pendulum rapidly swung to extreme optimism, which even to this day manifests itself in the writing of many men. The reaction was not long in setting in and we find a tendency to return to the old nihilistic, pessimistic views.

It is absolutely necessary for a successful solution of the problem before us that our minds be unbiased by either radicalism or extreme conservatism, and although it is impossible to suggest, in the present state of our knowledge, any positive plan of treatment, we can nevertheless, outline the principles which should guide us in the management of our cases. Unquestionably our best results are obtained in those cases where early diagnoses have been possible. This has been the keynote to the successful management of pulmonary tuberculosis, and more stress should, therefore, be laid upon the study of the very earliest manifestations of the laryngeal affection. It is not our purpose to dwell upon the methods of making an early diagnosis. Three important guides may be found in, 1st, the peculiar anemia, 2nd, the irregular interarytenoid tumefactions, and 3rd, the defective motility of the vocal bands which is quite out of proportion to the visible pathologic changes.

It next becomes necessary to determine the stage of the affection, and to use the most careful judgment in applying the proper treatment for each stage. During the first stage every effort should be made, first, to improve the nutrition of the parts, by both local and general treatment, and, second, to facilitate the absorption of infiltrations. As the disease advances the character of the infiltration changes, assuming not infrequently the soft papillomatous variety, at other times advancing to a uniform fibroid swelling covered by unbroken mucous membrane, firm to the touch and attended with marked perichondritis. In the soft variety, surgical intervention by curette, forceps and lactic acid is without doubt the most satisfactory plan of treatment. In the firm fibroid infiltration, no remedy can be said to be of more than moderate value. Stimulating the absorbents by local applications of iodin-bearing products offers probably the best prospects.

In the stage of ulceration it is necessary to differentiate between the sluggish, slightly painful ulcer, which is usually large and of greater depth, and the small, numerous, very superficial ulcerations, which develop with great rapidity and which approach the miliary variety. In the former, stimulation by curette and lactic acid, followed by the application of iodoform, will often result in marked improvement and occasionally in cure. In the active superficial variety there is usually much edema, indicating extreme acuity in the affection. The greatest caution should here be exercised in the use of too radical or irritating a remedy. Soothing, quieting, palliative and antiseptic treatment should be instituted. Thorough cleansing, followed by a weak cocain or eucain solution and this in turn by the insufflation of a powder containing morphin, tannic acid and iodoform, after Bosworth, has in my hands frequently retarded the progress of the affection, relieving the acute symptoms to such a degree that the ulcerations have disappeared and the edema has subsided. After reducing the acute symptoms, should there remain ulcerations which take on a chronic, sluggish character, one need not hesitate to adopt more radical surgical measures.

In the cases of extreme ulceration, the treatment outlined by Freudenthal, the most important part of which is the use of his menthol-orthoform emulsion, has been most satisfactory. It does not, however, appeal to me as a curative method, but certainly forms a valuable adjunct to those cases which may subsequently be treated with a cure in view. It becomes necessary, furthermore, to determine at all times whether a palliative or curative plan of treatment should be adopted, and, more frequently, whether both may not be used. Nicety of judgment will determine also which plan should be followed first, and when it is safe to adopt the other.

I cannot too strongly urge the importance of careful investigation into the patient's general condition. The relative importance of local and constitutional treatment should be constantly borne in mind. There are times when the distress and exertion caused by well-meant local treatment are a severe drain upon the patient's general well-being, and will result in less good than careful attention to rest and constitutional treatment without any local attention whatever. Patients who have no dysphagia, no distress in the larynx, whose only local symptom is hoarseness, and whose general condition indicates a tendency to rapidly progressing disease, had better be advised to give all their attention to constitutional treatment, and I entirely agree with Thompson when he advises for this class of cases rest and sanatorium treatment. Should the patient make decided improvement after more or less treatment of this character, one may then proceed to the relief of local conditions.

This very imperfect outline of the essentials in the treatment of laryngeal tuberculosis bears the stamp of that same indefiniteness which I had hoped to find cleared up by so respected and able an author as Thompson, but which it seems must remain to worry us until such a time when more positive knowledge and more satisfactory methods will redeem such a large proportion of our race from the great white plague.

XVI.

EXTERNAL NASAL NEOPLASM.

By John C. Lester, M. D.,

BROOKLYN.

A careful examination of nasal literature has failed *in toto* to disclose any report or reference to growths starting from, or having their origin in the external structure of the nose, or in the tissues immediately related thereto.

Of course, syphilitic periostitis, perichondritis, etc., are excluded, being local manifestations of the general dyscrasia.

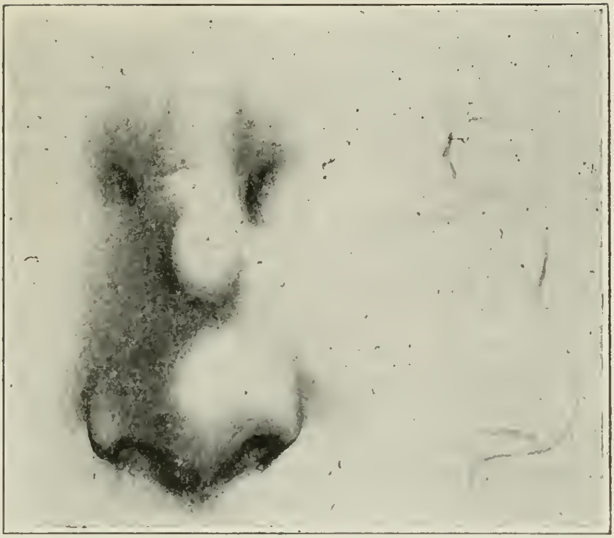
Hence the report of the following case, as far as the writer knows, would seem to be unique in rhinologic literature.

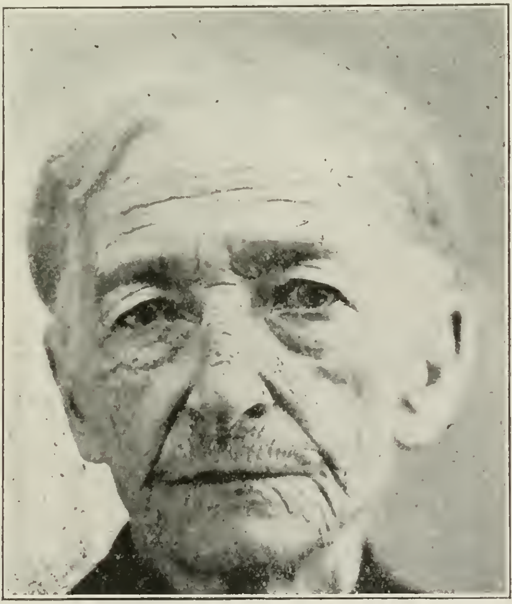
Mrs. C., aged 80, consulted the writer about a growth on the nose, which, according to the patient's statement, had existed for two or three years, and had been looked upon only as a warty excrescence.

For the past six weeks, prior to examination, the growth had increased in size so rapidly as to become a marked deformity and occasioned no little concern on the part of the sufferer.

An examination revealed the presence of a large, cup-shaped symmetrical neoplasm, firmly attached to the middle third of the nose. The drawing made at the time—(the patient positively refusing to be photographed with the tumor in situ)—gives an accurate idea of its broad basal attachment and general appearance, as to size, shape and contour. The history of the case, general appearance of the growth, the deformity, caused the writer to recommend an immediate surgical interference, to which consent was readily given. The physical condition of the patient, age, etc., precluded the use of a general anesthetic, and a local anesthetic was employed.

An elliptical incision was made, entirely encircling the growth and deep enough to include all the tissues down to





the cartilage and lower third of the nasal bone. With the exception of a free hemorrhage necessitating the torsion of a few blood vessels, the enucleation was readily accomplished. The tissue about the wound were dissected up sufficiently to close the same without undue tension. Union occurred by first intention, and the condition of the wound is accurately represented in the accompanying photograph.

Microscopic examination of the growth was made by Dr. Dixon, who reported as follows:

"Referring to the case of Mrs. Clark, 80 years of age, tumor from whose nose was submitted to me, I beg leave to say that it was an epithelial growth in the form of a degenerating wart. There was considerable irritation at the sides and base, and a marked tendency throughout to the formation of 'pearls,' or whirls of epithelium. The surface presented the usual corneous layer. Invasion of the surrounding tissue did not seem to be very active, but there seemed to be a tendency in that direction. While possibly not malignant at the time of removal, the growth had evidently reached the border line."

The points of interest in this case are: The presence of an apparently benign, small, warty growth existing for some years; its sudden increase in size and maligant transformation; its vascularity and depth of attachment; and the subsequent history, there being no return after three years.

179 Schermerhorn St.

XVII.

THYROTOMY FOR LARYNGEAL PAPILLOMATA.*

By Edward F. Parker, M. D.,

CHARLESTON, S. C.

LECTURER ON DISEASES OF THE EYE, EAR AND THROAT, MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA.

A young lad, J. L., aged 7, was presented for examination in June, 1901, on account of dyspnea and aphonia. When two and a half years old he had been very ill, and shortly after that time his breathing became more or less difficult and his voice somewhat impaired. These symptoms gradually grew worse and, when first under my observation, the aphonia was complete and the dyspnea considerable.

On account of the extremely nervous condition of the patient and the insuperable irritability of the fauces and throat no satisfactory diagnosis of the laryngeal lesion was made.

The tonsils were much enlarged and the nasopharynx filled with adenoid vegetations, and removal of these under chloroform was advised and accepted.

No improvement in the general condition followed, however, and in three weeks he was brought back to me worse than before. The dyspnea had markedly increased, inspiration was labored, and the heart's action was weak, and with night sweats and cough he had lost strength and flesh.

Laryngoscopy was again difficult for the reasons mentioned and an overhanging epiglottis allowed only imperfect glimpses of the larynx.

A cauliflower-like growth seemed to almost fill the glottis and a diagnosis of multiple papilloma was made.

Removal of the growth seeming impossible by intralaryngeal methods, thyrotomy was chosen as the most advisable route.

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*Read before the Southern Section of the American Laryngological, Rhinological and Otological Society, Aiken, S. C., Feb. 3, 1902.

On July 7th, a tracheal canula was introduced under chloroform but the bad behavior of the patient induced me to delay further operation until three weeks later, when his health and strength having much improved, and all attempts to remove the whole or any portion of the growth by endolaryngeal methods having failed, a thyrotomy was performed and a large number of small wart-like tumors generally distributed over the cordal, sub-cordal and supra-cordal regions of the larynx were removed with a small wire snare and a sharp ring curette.

After opening the larynx in the usual way a four per cent. solution of cocain was applied and the tissues further bleached and contracted with a 1 to 1,000 solution of adrenalin chlorid. These greatly facilitated the removal of the papillomata. After curetting the debris, the larynx was thoroughly cleansed and a 30 gr. — ʒi solution of nitrate of silver applied to the mucous membrane.

Hemorrhage was slight and interfered but little with the constant inspection of the field of operation, which was well illuminated with a concave mirror.

The skin and thyroid cartilage were adjusted with several silk worm gut sutures, passing at once through both structures so that the necessity for buried stitches of silver wire or cat-gut, as usually recommended, was wisely avoided.

Two weeks later the tracheotomy tube was removed and he was discharged from the infirmary, looking and seeming well and hearty. At this date his mother reports that there has been no recurrence of the growth as far as the symptoms indicate, and that his voice is gradually regaining its normal strength and power.

Extralaryngeal operations were seldom resorted to before the discovery of the art of laryngoscopy, owing to the inability to make a diagnosis in those diseases which demanded such operations. With the introduction of the laryngoscope, thyrotomy was at first more frequent, but as the technique of endolaryngeal work became more perfect and the skill in its performance grew apace, the external incision for the removal of laryngeal growths and foreign obstructions became less frequent.

At the present time most of the text-books suggest thyrotomy only as a last resort on account of the danger to life and the possible permanent injury to the vocal apparatus.

The operation performed in the case detailed above differed but little from that usually described but its success suggests to me a wider application of this method of exposing the laryngeal cavity to view.

Some do not regard the operation is itself as very dangerous, nor liable to be attended with grave complications. Hemorrhage is the chief contraindication.

To avoid this a preliminary tracheotomy may be considered advisable in nearly every case, unless the tumor or foreign body is small and promises to be capable of rapid removal with little hemorrhage.

The tracheal canula allows the lower end of the larynx to be closed with cotton to prevent the blood from passing down the trachea, and the temporary abolition of the respiratory movement of the larynx favors a much more satisfactory exposure of the field of operation as well as a more accurate manipulation of the instruments for the complete removal of the growth and the application of agents to prevent its return.

Children will not often submit to laryngoscopic treatment or even examination, and removal of obstructions in the larynx then becomes very difficult, tedious or impossible.

The amount of risk, though small, in opening into any part of the air passage is sufficient perhaps to deter us from performing an operation like thyrotomy unless life is endangered by dyspnea.

The impairment of vocalization is no greater, however, I judge, than that produced by the often incomplete restoration of the vocal function after endolaryngeal operations.

The shock and danger of a thyrotomy is usually increased and largely accounted for by the impoverished condition of the patient, whose respiration and nutrition have probably been seriously embarrassed for some time. In well nourished children especially, and often in adults presenting unusually intractable throats, a thyrotomy might easily, I believe, be indicated in preference to a safer but tedious and often incomplete endolaryngeal operation, if we weigh in the balance the possibility, in each case, of a complete, rapid and radical cure.

I cannot agree "that previous or simultaneous tracheotomy, although it has been performed in by far the greater majority of the cases, is not required by the nature of the operation unless there be other conditions necessitating its performance, such as dyspnea."

A tracheal canula may allow us to try more satisfactorily endolaryngeal methods, and is certain to be of great service in any subsequent operation.

Mackenzie suggests that "the operation ought never to be performed for loss of voice alone," and that "the operation should be confined to those cases in which there is danger to life from suffocation or dysphagia, and even then should only be performed after an experienced laryngologist has pronounced it impossible to remove the growth per vias naturales."

Paul Bruns goes further and holds that it should be done only after endolaryngeal removal has been attempted in vain by an experienced laryngologist.

We should certainly have no hesitation in opening the larynx externally, if a radical cure can be facilitated thereby, and if by the endolaryngeal route equally satisfactory results cannot be obtained.

XVIII.

REPORT OF AN UNUSUAL CASE OF NASO-PHARYNGEAL ADENOIDS.

By Carl E. Munger, M. D.

WATERBURY, CONN.

ASSISTANT SURGEON, MANHATTAN EYE AND EAR HOSPITAL; LARYNGOLOGIST AND AURAL SURGEON, WATERBURY HOSPITAL;
NEW YORK.

It would not be surprising if we should occasionally meet with a case of nasopharyngeal obstruction which would present conditions entirely at variance with our preconceived ideas. Of the various new growths, tumors, hypertrophies, etc., there are usually named myomata, fibromata, sarcomata, carcinomata, chondromata (2 cases) adenoid vegetations.

Of these obstructions, adenoids are by far the most frequent, and the means of diagnosis are usually so simple and sure that we have little difficulty in determining the nature and amount of the obstruction. That even so familiar and simple a thing as diagnosing nasopharyngeal obstruction is sometimes attended with difficulty, is excedingly well illustrated by the following case which I will briefly report.

S. R., a boy aged 13, was brought to my office with the complaint that he was a mouth-breather, that he was restless and breathed hard at night, that he had an irritating, tickling cough in the morning, and that he did not hear readily.

His facies was indicative of nasopharyngeal obstruction, and his palate was high-arched. A posterior rhinoscopic examination being very difficult on account of the irritability of the throat and the impatience of the boy, digital palpation detected a mass lying in the nasopharynx and filling it to a sufficient extent to markedly impede nasal respiration. The impression given the examining finger was the same that we all expect when we encounter a mass of adenoid tissue in this region, and the diagnosis was accordingly made of adenoid vegetations in the pharyngeal vault and removal advised.

Several months later the boy was brought in for operation, ether given, and the mass removed by Gradle's adenotome. No unusual force was required and only the usual amount of post-operative hemorrhage ensued. Up to this point I had no intimation that I had not an ordinary case of adenoids to deal with, but upon examining the excised mass I found what appeared to be cartilage covered with soft tissue, some of which was hypertrophied adenoid tissue. The nasal stenosis disappeared and has so remained to the present time.

The specimen was sent to Dr. Harmon Smith, who forwarded the following report:

"The body of the mass is fibro-cartilage, probably originating from an inter-vertebral disc; this is covered in by loose connective tissue containing numerous mucous glands, which are normal. There is a layer of intensely inflamed lymphadenoid tissue covered in by a layer of normal epithelium, eroded in places.

Observations: Recurrence at point of origin possible but not probable. Metastasis will not take place. It is non-malignant."

I report this case, not only on account of what I believe to be its extreme rarity, but also, as showing the necessity for carefulness in diagnosing nasopharyngeal obstruction, and operating for the same.

Examination at the present time shows a whitish line at the seat of wound, transverse to an antero-posterior plane passing through the naso-pharyngeal space, and situated at what I should suppose to be the first intervertebral space.

XIX.

THE FREQUENCY OF ETHMOIDITIS IN SO-CALLED NASAL CATARRH.*

W. B. SHIELDS, M. D.,

ST. LOUIS.

Inflammatory conditions of the ethmoidal region, both acute and chronic, will always be of much interest to the rhinologist and laryngologist, more especially on account of its increased recognition as one of the causes of laryngeal and ocular derangements. It is true that the subject has been gone over thoroughly at different times by many competent observers, nevertheless I shall always regard it as one worthy of discussion, and of great interest as one of causation of so-called nasal catarrh as well as the above mentioned affections.

It is hardly necessary in a paper of this kind to go thoroughly into the anatomy and physiology of the ethmoidal region, as all of us are familiar with both. But I shall touch upon the former, more especially on its deviation from the normal. I can see no reason for separating the anterior and middle ethmoidal cells, as is done in most text books, as in the majority of cases they form one mass of cells with no marked dividing line. In the majority of cases that I have treated for affections in this region, the most frequent deviations from the normal anatomic conditions of the parts have been either a much enlarged tuberculum septi, a high deviation of the septum, or more or less enlargement of the middle turbinate, the latter due, of course, to inflammatory conditions of the parts either on the account of presence of purulent secretion, irritation of pressure, or inhalation of air laden with dust and microorganisms.

The subject of nasal suppuration has been gone into thoroughly by Grunwald, in his excellent work of that title. After a most painstaking and thorough investigation, he has come to the conclusion that purulent rhinitis is a disease of great rarity in the adult, and that, while it is more frequently found in children the majority of cases in the latter are due to adenoids preventing drainage of the nasal cavity, the retained secretion being decomposed and forming the so-called purulent rhinitis.

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*Read before the Middle Section of the American Laryngological, Rhinological and Otological Society, St. Louis, Feb. 22, 1902.

I am of the opinion that it is the lack of free drainage that causes the vast majority of cases of purulent rhinitis in children, for the same process does not occur in the pharynx or fauces, both of which are richly supplied with epithelial cells, and it is the desquamation of these cells from the nasal mucous membrane and their subsequent decomposition which is supposed to be the cause of the purulent secretion. All the cases of purulent discharge from the nose of adults that have come under my observation, except those due to syphilitic lesions, have been found to be due to a diseased condition of some one of the accessory cavities and it has been my experience to find the majority of these cases ethmoidal in origin. This is not the experience of others who have found antral disease more prevalent.

When we take into consideration the frequency of enlargement of the middle turbinate, the large number of ethmoidal cells and the ease with which their openings in the middle and superior meatus can be closed by this enlargement, it looks more than plausible that ethmoiditis can and does occur more frequently than is supposed, both the purulent and catarrhal forms. A purulent ethmoiditis is much more apt to cause an inflammation of the antrum than the reverse, on account of the anatomic arrangement of their respective cavities.

I dare say that my observation on the relative frequency of a diseased condition of the ethmoidal and antral cavities is merely a coincidence, as nearly all observers of large experience are of the opinion that antral diseases are much more frequent.

Within the past eight months I have had several cases come under my observation of retention empyema of the ethmoidal cells, accompanied by headache and elevation of temperature, with a hypertrophied condition of the lower turbinate. These patients had been treated for the latter condition under the supposition that the headache was due to the hypertrophy. In this class of cases I have found the clinical thermometer of invaluable assistance in making a diagnosis, much more so than trans-illumination. In none of the cases mentioned had the temperature been taken. I think it is not a rare occurrence for this condition to be mistaken for hypertrophy of the lower turbinate, but if the thermometer is used at different times during the day one is very apt to find more or less elevation of temperature. While having the greatest confidence in the opinion of Grunwald, and in the results of his thorough investigation, still I do not agree with him in his radical views on the causation of ozena. He holds that it can nearly always be traced to some local disease in a nasal accessory cavity. I rather agree with Dr. Pynchon that a common-sense explanation of many of these cases can be given in the changed condition of the nasal secretion, on account of the atrophy of the mucous membrane, and lack of evaporation of the same, from which they become thick and present a pabulum for bacterial lodgment and activity. I do think, however, that a number of cases of ozena, especially the unilateral form, are due to purulent inflammation of some one of the nasal cavities and can be greatly improved by local treatment of the diseased area, but that every case of this disease must be a law unto itself.

In conclusion, I will say that I am of the opinion that chronic ethmoiditis, both purulent and catarrhal, is much more common than is generally supposed, and that many cases of post nasal catarrh, hypertrophic rhinitis and ozena are traceable to the irritation of the ethmoidal secretion passing over the parts in the nose and nasopharynx.

303 N. Grand Ave.

XX.

SEPTUM OPERATIONS UNDER COCAIN AND NITROUS OXID GAS.*

By B. S. Booth, M. D.,

TROY, NEW YORK.

It is my intention to describe as briefly as possible the operation for correcting deviation of the septum under the combined use of adrenalin chlorid, cocain and nitrous oxid. Some few months ago I read a paper, similiar to the one I am now reading, before the Section of Rhinology and Laryngology of the New York Academy of Medicine. In describing the technique of this operation at that time, I did not make use of nitrous oxid, but merely used adrenalin chlorid and cocain. In the discussion which followed the reading of my paper, a number of the members present were of the opinion that, considering the amount of pain and shock that must arise in consequence of an operation of this magnitude, a general anesthetic had best be given.

Since operating upon this type of cases under local anesthesia, I have found that there is but one step in the operation that is really painful, and that is the procedure of breaking up the elasticity of the septum, and inasmuch as this part of the operation takes but a few seconds it occurred to me to try a general anesthetic which lasted just long enough to allow me to accomplish this purpose. I selected nitrous oxid as being the safest and most easily given, and for the last six months I have been operating to correct this condition under adrenalin chlorid, cocain and nitrous oxid in the following manner: After irrigating the nose I apply a solution of adrenalin chlorid 1 in 5000 by means of cotton and applicator; after two or three minutes I apply a ten per cent. solution of cocain in the same manner, rubbing it thoroughly into the membrane for about ten minutes. By this time the field of operation is completely anesthetized and the membrane is thoroughly blanched. A sharp pointed bistoury is now plunged through the most prominent portion of the convex septum into the opposite nostril, the cutting surface of the knife directed anteriorly; after I have made a sufficiently large opening a blunt pointed curved bistoury is substituted to avoid injuring the tissue of the opposite nostril, and made to cut through the warped cartilaginous septum anteriorly. The bistoury is then reversed and passed through the warped cartilaginous septum posteriorly until the bony septum is reached. If the bony septum is included in the deviation, a small saw is now substituted and with it I divide a small portion of the bony septum. If the deviation is confined to the cartilaginous septum, the bony septum is not included in the antero-posterior incision. The operation has thus far caused but very little pain and comparatively no hemorrhage. I now apply more adrenalin chlorid and cocain as in the beginning.

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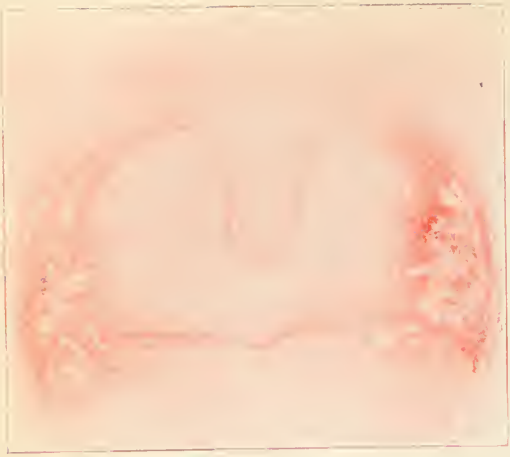
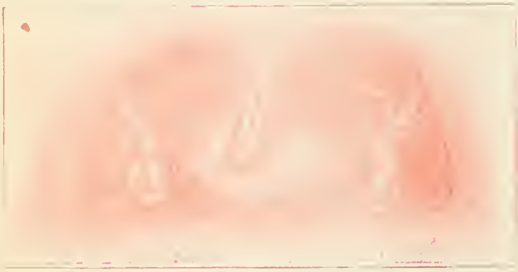
*Read before the Eastern Section of the American Laryngological, Rhinological and Otological Society, at its meeting in New York, March 1, 1902.

The next step in the operation will depend upon the extent of the deviation. If the bony septum is included in the deviation giving the nose a curved appearance, the tip of this organ being carried to one side, it is necessary to make two incisions, the first running from the bridge to the floor of the nose, crossing the antero-posterior incision, dividing the cartilaginous septum at the most prominent part of its convexity. The second incision is made to divide that portion of the septum lying between the upper part of the antero-posterior incision and the bridge of the nose just anterior to the bony septum. If there is no deformity of the external nose this last incision is unnecessary. These incisions are made with a sharp pointed bistoury. Up to this point in the operation I experience no difficulty. The patient as a rule will sit still and seldom complains of pain, and the absence of blood gives him courage. I now arrange the operating chair so as to place my patient in a semi-recumbent position and proceed to administer nitrous oxid in the usual manner in vogue by dentists. My apparatus consists of an inhaler, a bag holding five gallons and a cylinder which contains nitrous oxid. I find that five gallons are usually sufficient to produce complete anesthesia, especially if care is taken to eliminate any air from the patient. It is wise to place the inhaler in position, see that it fits the face snugly, and instruct the patient how he is to inhale when the gas is turned on. This will give him confidence. When this is accomplished turn on the nitrous oxid. I find that it takes from 15 to 20 deep inhalations to produce complete narcosis. When we are satisfied that this has taken place, which will be when our patient begins to snore, the inhaler is quickly laid aside. The septum is now grasped between the blades of a pair of Adams' forceps and by a rotary movement the resiliency is carefully broken up, using care to loosen it from the floor of the nose; the forceps are now removed and the index finger is introduced into the nostril containing the convexity and the septum is pushed into the opposite nostril. By this time the patient has regained consciousness. I now introduce previously selected splints into the nostrils to hold the septum in the median line. The patient is allowed to rest in my office a few minutes, after which he is ready to go home. The subsequent treatment is the same as in all similar operations. This seems to me to be an improvement over using either general or local anesthesia separately. It certainly is more practical, humane and less dangerous.



Dr. Robertson's Case



Dr. Ballenger's Case.

XXI.

PHARYNGO-MYCOSIS LEPTOTHRICA OR HYPERKERATOSIS PHARYNGIS.

By Joseph C. Beck, M. D.,

CHICAGO.

This affection, until Siebenmann of Basel, in 1894, described the true pathologic condition, was known as pharyngeal mycosis leptothrica. From that date cases are reported under the old as well as the new nomenclature.

The history of this affection dates back to 1873, when B. Frankel first described the condition as mycosis tonsillaris benigna. Th. Heryng, of Warsaw, stated that up to 1883 six cases had been reported. Eugene Frankel, of Hamburg, reported about that time a case of mycosis of the tongue. This was examined microscopically by Prof. Sadebeck, who found a bacillus that had the appearance of bushes, and classed it as the bacillus fasciculatus and pronounced it the specific organism of this affection. Dr. L. Beyers reported two cases, and Gubiner one. Heryng reported six cases; one being of special interest, having often been reported in literature, I will simply allude to it briefly because since then the specific organism was thought to have been found, i. e., the leptothrix buccalis. The patient was a physician, Dembici, who had been treated for a long time by Prof. Biesiadecki, of Krakow, who examined removed masses, by the iodin reaction, which was characteristic and, therefore, spoke of an amyloid degeneration of the pharynx. Later the patient consulted Prof. Stoerk, of Vienna, who also removed tissue with masses and found calcareous degeneration with mucin and cholesterin crystals, and he diagnosticated the case as calcareous degeneration of the pharynx. The patient did not improve. On the contrary, the condition continually recurred and increased. Finally he consulted Prof. Klebs, who at that time was at Marienbad, where the patient was sent for his health. He examined portions removed and found the leptothrix buccalis, and published his original article, "Uber eine Mycose der Mundhöhle." The patient then gave up treatment.

Being a student in botany and the lower types of organic life, he was familiar with the fact (as it had been explained to him by Prof. Klebs) that the causative factor of his ailment was an organism; that tobacco prevented the growth of he was willing to try its application on himself. He therefore used strong, heavy cigars, smoking constantly for two months, after which time the condition entirely disappeared.

From that time on, until Siebenmann described the true pathologic condition, many cases have been reported with slight modifications in their description; for instance, Jacobsohn (Volkmann's Klinische Vortrage, 1887), as algosis faucium leptothrica: Jonathan Wright, in the New York Medical Journal. 1895, I, p. XII, approaches very closely to its true description, but claim the specific cause to be the leptothrix.

DEFINITION.

A development of small, yellowish-white, projecting, pointed masses, the size varying from that of a pencil point to that of a needle point; sometimes single, more often conglomerated, forming small groups, difficult of detachment, in Waldeyer's ring, which includes the velum and uvula, anterior and posterior pillars of the fauces, the palato-glossal folds, the base of the tongue with its lingual tonsil, glosso-epiglottidian folds, the faucial tonsils posterior wall of the pharynx and post-nasal space.

PREDISPOSING AND EXCITING CAUSES.

(A) Predisposing causes are:

1. Inflammatory conditions in the lymphoid tissue about Waldeyer's ring.

2. Lowered vitality in anemic subjects, slight gastric and intestinal disturbances.

3. Sex. Female neurotics are said to be more prone to its development. I have found from cases collected 56 women and 39 men, 96 not classified.

4. Age. It is most prevalent in the young adult. Cases

range from two years to 76 years; the greatest number between the ages of 18 and 25.

5. The hygenic surroundings play a role, for when a patient is ordered a change of air, conditions have often been benefited or cured.

6. Tobacco. Men who smoke are less often afflicted, and the fact that women do not smoke has been given as a probable cause.

7. Social Condition. The better class of people are more apt to have it. Colored race not exempt.

8. Dental caries and acidity of saliva.

B. Specific Cause. None is known. The leptothrix buccalis, which has long been held to be the exciting cause, is now classed by the late observers as coincident, because it is constantly present in every buccal cavity where decomposition is going on, i. e., about bad teeth. For some time it was thought that the leptothrix was responsible for dental caries, but this has been disproven by Miller. Hornification of the epithelium is said to be due to the loss of vitality of the cells, within a lymph follicle. Prevost says that leptothrix, oidium albicans and aspergillus fumigatus are all concerned as causative factors of this affection.

COURSE.

There appear first yellowish nodules under the mucous membrane, which open up and show the characteristic white masses. These project and remain attached firmly for quite a while, when they soften up and drop off and others reappear. Their course is indefinite. Some last months, disappearing and recurring again (but rarely) while others last for years continually. Others again last for a shorter period when they disappear and do not recur. Irritation and acute inflammation about the throat increase their development.

PATHOLOGY.

(a) A cornification of the epithelium of the lymphoid tissue in the pharynx.

(b) Leptothrix buccalis.

Siebenmann states that the reason this cornification takes place in the pharynx rather than in the posterior nares or in the larynx is because the lining membrane is made up of flattened epithelium, which hornifies more easily than the cylindrical which lines the post-nasal space, the larynx, etc.

Microscopic examination of a portion of tissue removed in which the change took place, shows a cyst wall in which there are a large number of epithelial cells, some looking like the cells of hair (homogeneous). On top of this broken cyst wall are found the leptothrix and other bacteria. But little inflammatory condition is present. The leptothrix plays here the part it does anywhere else where decomposition goes on, namely, its lodgment after the condition has developed. So we find it about carious teeth, old carcinomatous masses, leukoplakia pharyngis, in plugs of follicular tonsillitis, ozena, etc. There are several varieties of the leptothrix found. The specimens show two distinct varieties:

1. Large, bushy varieties in which the divisions of the chain are not distinctly seen. 2. The more isolated in which the space is well marked.

The leptothrix buccalis is a vegetable fungus arranged and growing in threads of different lengths, sometimes appearing in bundles, 0.7-1.5 in thickness, colorless; it develops rapidly in blood serum. In an acid medium it gives the characteristic starch reaction with Lugols solution.

SYMPTOMATOLOGY.

The patients do not, as a rule, complain very much; a sensation of scratching, some difficulty in swallowing, a kind of stiffness in the throat, easy tiring in speaking; sometimes pain running along the side of the neck. When large masses are located about the lingual tonsil, hawking has been described. As a rule, discovery is accidental, either by the patient or the physician at a casual examination. Its persistency and its resemblance to grave conditions in the throat are what usually bring these individuals to the physician's and later to the specialist's notice.

DIAGNOSIS.

The principal characteristics are:

1. Small yellowish-white excresences, at first hard to remove.
2. Confined to Waldeyer's ring.
3. Cornified epithelium with leptothrix is the makeup of the masses when examined microscopically.
4. Absence of marked local inflammatory conditions or grave general disturbance.

The disease must be differentiated from.

1. Diphtheria.
2. Acute lacunar tonsillitis.
3. Chronic lacunar tonsillitis.
4. True mycosis pharyngis leptothrica.
5. Herpes angina.
6. Plaque mucose.
7. Tuberculosis.
8. Thrush and soor.
9. Pemphigus.

In diphtheria the grave constitutional symptoms with the membranous appearance in the throat with violent inflammation, and above all, the microscopic and culture examination will clear the diagnosis.

In acute lacunar tonsillitis we have marked constitutional symptoms, marked inflammation in the throat, confined to the tonsils, and in course of a few days the condition disappears.

In chronic lacunar tonsillitis we can express the plugs easily. They have a fetid odor, and as a rule, when removed, do not recur. Moreover, they show leptothrix and cholesterin.

In true mycosis pharyngis leptothrica we may make a mistake microscopically, but only in finding the leptothrix; here it is much more abundant. There are constitutional symptoms, marked local inflammation and edema. The process extends outside Waldeyer's ring, so it may travel down to the larynx, bronchi and lungs to the esophagus and into the naso-pharynx and nose.

In herpes angina, the lesions are minute blisters, as a rule confined to the arch of the soft palate and uvula.

In plaque mycose, history of syphilis and other secondary symptoms.

In tuberculosis, secondary and grave tubercular symptoms are usually present. Microscopically, tubercle bacilli are present.

In thrush and soor, the microscopic examination is significant. The location is usually in the buccal cavity; the age of the patient is a matter of diagnostic importance.

In pemphigus, there is usually the same condition present about the skin. (Jonathan Wright describes one case.)

PROGNOSIS.

The prognosis is entirely favorable. It seems that if nothing is done the patient will get along better than if treated, and yet it has been observed that these patients are, as a rule, very much concerned about their condition and oftentimes depressed. It would be unwise not to do something and doing something may influence the condition at times. Many authors report good results from treatment.

TREATMENT.

In tabulating the cases separately I mention what some authors have used and considered the best treatment, and in conclusion I give the treatment I used in my cases.

Some of the remedies and methods of treatment used by the above are as follows:

1. Cautery (galvanic).
2. Tonsillectomy.
3. Curettement of masses.
4. Chromic acid.
5. Trichloracetic acid.
6. Carbolic acid, 95 per cent.
7. Nitrate of silver, 90 grains to ʒi.
8. Swab with saturated alcoholic solution of salicylic acid.
9. Gargles of
    - *a*. Peroxid of hydrogen.
    - *b*. Permanganate of potash.
    - *c*. Bichlorid of mercury.
    - *d*. Formalin.
    - *e*. Listerine.
    - *f*. Alcohol.
10. Pyoktanin painted over surfaces.
11. Sodium sulphate, 5 per cent. solution.
12. Infusion of tobacco, evenly applied.

AUTHOR.	No. cases	SEX.	AGE.	TREATMENT.
Frankel. B.	?			
Klebs, E.	1	Male		Removal by curette, forceps. etc., and local applications of medicine.
Baginski	1			
Frankel, Eugene	1			
Bayers. L.	2			
Gumbiner	1			
Heryng	7			
Hemeuway	1	Female		Cautery and excision of tonsils.
Milbury, F. S.	1	Female		
Price-Brown	3	2m. 1f	19. 40, 50.	1 larynx involved.
Wright. Jonathan	4	Female	3 young, 1 middle age.	
Ingals, E. Fletcher	14	7m, 6f	41, 34. 17. 63, 14, 16. 32. 23. 30, 27, 22, 28.	Cautery recommended.
Bean, C. E.	1	Female	26.	Cautery.
Evans. T. C.		Not	Classified.	
Gray	1	Male	32.	Larynx involved.
Campbell, J. T.	1	Female & sister (?)		
Carpenter, Julia W	2	1m. 1f		Almost all used the cautery more or less in combinat with some treatment as stated below.
Foster, H	2	Female		
Dowuies. W.	7	3m, 4f		
Gevaert	2			
Toeplitz, Max	3	2m, 1f		
Bach	2			
Renault	1			
Bosworth	1			
Donnellon	1	Male		
Masse	1			
Kelly, A. Brown	10	5m, 5f	18, 29, 23. 22. 40, 30. 50, 33. 26.	
Sieberman	6	Female	8, 25.	
Chiari, O.	3			
Decker and Siefert	1	Male	50.	
Krasnobayeff, T. P.	1		1 yr, 5 mo. (Youngest subject.)	
Thorue, Atwood	1	Female		
Dubrer	1	Boy	8.	
Puterman	1	Girl	20.	
Kayser	3			
Michelson	5			
Jurasz	3			
Gerber	2			
Wroblewski	18	10f, 8m		
Seifert	10	7f. 3m	10. 21. 22, 23. 26. 19, 52, 25. 45, 30.	
Oltuzewski	1	Female	16.	
Schieffer	1			
Taber	1			
Gorris	3	1f, 2m		
Newcomb	1			
Krieg	37			
Mettenheimer	2			
Michelson (2d Series)	14			
Jacobson	3	2 Girls. 1 Boy	14, 16 and 17 years old.	
Coulter. J. Homer	1	Female		

Case I. Miss S., 21 years old, a student, noticed on looking into her throat some white spots, giving her no trouble whatever. She only feared the condition might be serious. Consulted Dr. Emil Beck, who diagnosed the condition as follicular masses (degeneration plugs) in tonsils; pressed them out and removed them with forceps at intervals of two or three days. Patient was referred to me about the third week of treatment. The accompanying figure will illustrate the appearance of her throat. White spots of various size were seated over tonsillar surface, and anterior and posterior pillars of the fauces and in the glosso-pharyngeal fold. The crypts of the tonsils were filled at some places with these white masses, which were very tenacious and had to be removed by scoop or forceps. Some of these particles stuck out in a pointed way, and upon attempt to remove them by means of forceps would hold tightly but finally come out without any bleeding. Especially in the glosso-pharyngeal fold were these particles firmly adherent and it was almost impossible to remove them.

The patient was of a nervous temperament and once after a treatment had a typical hysterical attack. The teeth of the patient were bad. I sent her to a dentist with my diagnosis, which had been made by aid of the microscope, to learn whether there were any cavities, etc., but his answer was negative, all cavities having been filled. The patient had periodically developed a herpes labialis and told me that as a rule this followed some indiscretion in diet. Slight anemia was present. The treatment in this case was local, hygienic and general; her diet was modified and gastro-intestinal disturbances were corrected; an iron tonic prescribed; hydrogen peroxid as a mouth wash and gargle prescribed, with alcohol and listerine equal parts. The local treatment consisted of everything, almost, that had been recommended: curetting off these white masses and swabbing with bichlorid of mercury, formalin, the use of chromic acid, silver nitrate in strong solution. The use of the actual cautery and saturated alcoholic solution of salicylic acid was unavailing and as there was nothing that seemed to influence it in the least, I took the advice of the men who advocate leaving the condition alone, and accepted the suggestion of sending patient away for a trip, and a change of scene; on the return of the patient, the mycosis had disappeared. After three months the patient reported again with no recurrence.

Case II. Miss G., ten years old; parents noticed that the child became hoarse and hawked at times; on looking into the throat, they saw some white spots which they tried to swab out but could not. Consulting a general practitioner, he advised gargles, but the spots did not disappear. Patient was brought to me August 14th—a well nourished child, with a hoarse voice; teeth in bad condition; an offensive odor from the mouth, the tonsils slightly enlarged, and on their surfaces as well as from the crypts white masses protruded. At the base of the tongue in the region of the epiglottis, similar masses are seen. On the posterior wall of the pharynx there were two or three distinct spots, yellowish white in appearance, apparently under an epithelial layer.

I referred the patient to a dentist, who treated the teeth and to my surprise found that, two weeks after, the patient was cured of the hawking and the spots had entirely disappeared. For local treatment, a simple gargle of borolyptol was used.

Case III. Miss von M., Assistant Professor, University of Chicago, 40 years of age, noticed some white spots in her throat, and on the dorsum of the tongue. The latter are giving her trouble, such as a burning, scratching feeling. Patient had been operated upon for antral disease, and wears a tube through the alveolar process, also has two plates of artificial denture. The patient is highly neurotic; she had her ovaries removed early in life, and several times has been afflicted with hysterical aphonia. The mycotic masses were situated principally on the soft palate, on the pillars and tonsils; the dorsum of the tongue in the middle part presents a distinct white mass very firmly attached. Attention was given to the cleansing of the antrum, nose and throat. Condition improved, but now, almost six months since she was first observed, the white spots are still present to a certain extent. Actual cautery of the tongue improved the condition.

Case IV. Miss M., 22 years old, clerk, for several months observed a disagreeable scratching in her throat and also observed white spots on both sides of her throat. Teeth in a very bad condition. The whole oropharynx covered with whitish masses of mycosis, firmly adherent and giving to the finger the sensation of bristles. A saturated solution of salicylic acid was applied thoroughly to all the surfaces of the throat. Patient did not return, but I have heard that the condition entirely disappeared after attention to the teeth.

Case V. Mrs. N., 28 years old, colored, had for the past year a sensation of scratching in the throat, some difficulty in swallowing, and fatigue in speaking and at times a very offensive odor from the mouth. The oropharynx shows scattered yellowish white masses, on the tonsils particularly and extending deep into their crypts. Some are very firmly attached, while others come off quite easily with a swab. Post-nasally, a few white spots are seen and, along the lingual tonsil, large masses of the same character can be made out. I advised the patient to smoke four strong, clear Havana cigars daily for six weeks and made local application of extract of tobacco to the parts, with the result of improvement as far as the symptoms were concerned and the odor disappeared. The masses were getting softer and fewer in number, but owing to the inability of the patient to remain in Chicago, I was compelled to leave off observation.

Case VI. Miss G., 15 years old, has ozena fœtida. Had many masses in her throat at one time, but they disappeared and now only one is seen on the left posterior pillar. It has the appearance of a cyst wall, with a whitish mass protruding through it. On removal of these masses, which are firmly held, a small cavity is seen.

Case VII. Miss P., about 20 years old, atrophic rhinitis of the inferior turbinated body, marked hypertrophy of the right middle turbinated, with some pus coming from the upper nasal region. Removal of the anterior portion of the middle turbinated body shows it to be subjected to cystic degeneration and a fluid simulating pus exuding from it. On her right anterior pillar is found a white spot made up of mycotic mass, firmly adherent, but without inflammatory signs.

Resume: All cases showed microscopically the leptothrix buccalis. Two cases showed considerable hornified epithelium and a number of other micro-organisms. All the cases appeared in females. Five had bad teeth, and two suppurative and atrophic rhinitis, and on treatment of the same showed marked improvement. Local treatment, including operative treatment, had but little influence on the condition. If anything, it aggravated it.

The following two cases I received from Drs. Ballenger and Robertson, and take great pleasure in reporting the same in connection with mine.

DR. W. L. BALLENGER'S CASE OF TONSILLAR MYCOSIS.

Miss P., age 23 years, student of vocal music, called upon me January 23, 1901, complaining of a tonsillar affection. She stated that she had just returned from Vienna where she had been engaged in the study of vocal music during the past year. She called upon B. Frankel on account of a throat trouble that seemed to interfere with her progress in singing. He pronounced it tonsillar mycosis.

Upon examination several tufts of ivory white material were seen at the mouths of the crypts of the tonsils. They were tough and firmly adherent and only removable by including the epithelium of the tonsil. They seemed to be composed of rods or pillars of material, as they were in several places pointed or conical in arrangement, as shown in the colored illustration.

The treatment consisted of cautery dissection of two masses of mycotic tissue at each sitting, under cocain anesthesia. In all 15 cautery dissections were made, as some of the dissections had to be repeated in order to eradicate the growth.

The patient was last seen September 20, and there had been no return of the growth. The voice, however, had not regained power and endurance. It should be stated that the tonsils are hyperplastic and should be removed. This procedure would in all probability do much in restoring normal physiologic activity to the vocal apparatus.

DR. ROBERTSON'S CASE OF PHARYNGEAL MYCOSIS.

Miss M. H., age 20, had always been healthy save for an attack of diphtheria 4 years ago. During the past summer while at a summer resort enjoying the best of health, upon examining her throat with a mirror on account of a stiff sore feeling, she noticed a small white speck on the left tonsil near the top of the gland. She thought it perhaps a particle of cracker or food of some kind and attempted its removal, when she found it immovable. She consulted her family physician who curetted it but without success. She was given gargles of peroxid and astringents and later antiseptics, but the spot persisted and soon was seen to be in company with other spots of a similar appearance. This was the condition present when first I examined her. The accompanying cut shows about the picture presented. The small elevations which were shiny dark gray in appearance sprang from the crypts of each tonsil. Some of these little projections 4-6 mm. in length and 1-2 in diameter were removed and given to the pathologist. There were other spots of white accumulations, uneven in outline and size, which were more easily removed and not so hard as the conical or club-shaped prominences, and they were also sent to the pathologist. An operation for removal of each tonsil was done and the surfaces painted with 40 per cent. nitrate of silver solution. The remaining places on the pharyngeal wall, glosso-palatal folds and base of tongue were curetted and painted with various solutions, without avail. Actual cautery was resorted to and by the destruction of the growths and the mucous membrane beneath, they have gradually disappeared. Recurrence has been occasional but at the present time, a month after the first visit, the left side of the pharynx is clear and only a few masses remain on the base of the tongue well down toward the glosso-epiglottic fold. The report of the pathologist was that the club-shaped masses were similar to ichthyosis of the skin, being horny epithelium piled up on a basement epithelium and filled with very many varieties of bacteria.

The softer masses, however, give evidence of leptothrix buccalis together with great quantities of bacteria of other kinds.

The patient has become thinner, but by alterative tonic treatment is as present as well as she ever has been. She is cutting two third molar teeth which have caused her no pain or soreness. She has no bad teeth, stomach is in good shape, and thus far no cause has been discovered.

Of all the remedies used, including silver nitrate, chromic acid, salicylic acid in alcohol, none seemed of avail till the galvano-cautery was used. Since this has been used no spot once burned has had any recurrence. The tissues were not burned deeply—only through the mucous membrane. There was no pain or soreness afterward, and the patient is in a fair way to become entirely cured within a month.

The specimen containing leptothrix buccalis was taken so as to get down as deep into the membrane as possible.

In conclusion, I would like to state that this condition is much more prevalent than we would assume from the literature or from the text books. There are many cases reported off hand; for instance, an author will report one or two cases specifically and then state that he has had about thirty or forty cases. There certainly are many cases diagnosticated and treated without being reported at all, and many cases are treated by the general practitioner for follicular tonsillitis, etc.

In regard to the treatment, the common consensus of opinion favors the cautery treatment, as that has given the best results. A most striking feature about the development of this affection is that it is generally found in connection with some process of decomposition, as ozena, dental caries or the coated tongue.

Since the completion of this article the case of a boy seven years old, whose throat is filled with mycotic masses, came under my observation at the St. Joseph Hospital. I mention this because there are two interesting points in connection with it. He has a foul odor from the mouth, and on closer examination I find a chronic otitis media suppurativa, without much discharge, but with cholesteatomatous masses and an odor very similar to that from the mouth. By cocainizing the pharynx and by means of Michel's mirror, I was able to see the openings of the tubes with mucus about them. Siebenmann speaks of the leptothrix developing about the region of cholestatomatous ears, and I would suggest that the development of this case of pharyngo-mycosis may be due to this affection.

The second interesting point is the history of the mother and uncle of the boy, who were afflicted with the same condition in the throat for a longer period. The mother states that occasionally her throat is entirely clear, the condition again recurring; while her brother has never been free of this affection.

Again, I would make a plea for the study of the pathology of this affection, i. e., changes in the follicles of Waldeyer's ring due to some process of decomposition, and where the same cannot be localized, perhaps may be in the gastro-intestinal tract.

The true leptothrix mycosis is a condition much rarer and of graver prognosis. There are a few cases reported by Brown-Kelly in the Glasgow Medical Journal, 1896. In those cases the lepthothrix.buccalis is the etiologic factor and not a secondary development, as in the case of the condition under discussion.

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XXII.

A GENERAL CONSIDERATION OF HYPERPLASIA OF THE LINGUAL TONSILS.*

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While the lingual tonsil is a part of Waldeyer's lymphoid ring and partakes in many respects of the anatomic features of the faucial and pharyngeal tonsils, it differs from these structures somewhat as regards its histologic identity, its pathologic changes and especially its growth and developmental features.

Situated as it is, in the glosso-epiglottic fossa and in intimate relation with the base of the tongue and the superior opening of the vocal apparatus, the glands constituting the fourth tonsil influence, to a marked extent, the integrity of this region. Placed upon a base of lingual muscle fibres and separated from them by a layer of connective tissue, the individual glands roughly grouped to each side of the median glosso-epiglottic ligament produce separate aggregations of tissue which, on examination, will show very clearly the presence of two tonsils instead of one.

The follicular glands are irregular as to distribution and number, varying, as shown by Ostman, from 34 to 102, with an average of sixty-six, while the size varies from one-half to six millimeters. Upon the number and size of the glands depends, to a certain extent, the individual susceptibility to future hyperplasia, it being my experience that the greater the number of individual lymphoid groups in a given case, the earlier and more prominent will symptoms referable to this region become evident. It is essentially a lymphoid area, and through the superficial and deep lymphatic channels the parts are drained to the deep lingual glands, where further communication is established with the cervical lymphatics in immediate proximity to the bifurcation of the common carotid artery. The superficial glands which are recognized as the lingual tonsil vary in grouping in almost every individual; in one case they are evenly distributed along both sides of the median line, while in others the glands seem aggregated in a central group, hyperplastic changes taking place in the latter class, being the one in which the symptoms are prominently connected with the epiglottis. A third class, in which the glands are sparse and irregularly scattered, with a fibrous tissue interval, calls for little comment, as it is not subject to the same extent of morbid changes as the former groups.

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Normally the tonsil is spread over the surface and does not project outward as do the faucial tonsils, the glands being less elevated than those comprising the other tonsils. This is shown by McBride when he states that the glandular tissue of the lingual tonsil is normally present, but not in such quantity as to produce a visible prominence. Rarely in the healthy throat have I found the thickness of the lingual pad to exceed one quarter of an inch and when the glands project above the irregular flat surface upon which they are spread, one is justified, in the presence of symptoms, in considering the condition pathologic. To be considered normal, there should be a clear space between the tongue and epiglottis. In the stained section it is frequently possible to see the fasciculi from the underlying muscle penetrating into the gland and interlacing between the crypts.

Unlike the faucial tonsil, the lymph masses are not bound into a single mass, but even when hypertrophied, remain more or less isolated, it being always possible to recognize a definite interspace between the individual glands. In addition to the secreting glands, there are from four to sixteen aggregations of true lymphoid tissue arranged in a somewhat peculiar position around the follicles. It is rare to find a greater number than sixteen, but in a young girl I found twenty-three and, while she presented no symptoms, there was an unusual development of lymph tissue generally. The fibrous tissue underlying the submucous layer more or less binds the entire mass together and partially encapaulates it, while the surface is covered with an extension of the pharyngeal mucous membrane. The diverticulum of its epithelial layer, however, is single instead of compound as in the other tonsils. The mucous glands which are prominently identified with hyperplastic changes, form in part the basis of the lymph body, each gland developing a bulbous expansion enveloped by lymph cells which perform their function as a separate secreting gland.

Embryologically considered, it is of importance to appreciate that, at this point of the faucial isthmus, there takes place a conjunction of the epiblast and hypoblast, and the development of lymphoid tissue forming the tonsillar system ensues. The presence of mucous and albuminous glands comprising an essential bulk of the lingual tonsils also distinguishes this tissue from that of the faucial region, where they are but occasionally found, and from the pharyngeal tonsil, where they are entirely absent. and, while the lingual crypts are usually lined with epithelium identical with that of the other tonsils, it is at times possible, as pointed out by Wingrave, to find in some a lining of ciliated columnar cells.

While the lingual tonsil is developed at an early age, it has been accepted by many, as a matter of routine, that visible signs of its presence do not become evident until late in childhood. This I believe to be an error arising, no doubt, from lack of study of the pre-epiglottic space and in the general absence from symptoms in early life. In the child of ten or twelve years, the glandular elements can be readily seen, and it is not uncommon to find the tonsil enlarged to some extent in at least twenty or thirty per cent. of children. The age factor does, however, exert a distinct influence in the development of hyperplasia, and in this exists another qualitative difference between the lingual and faucial tonsils. Hyperplasia is not unknown at an early age. The case of Hickman's, of a child dying of asphyxia at birth, in which it was shown, by autopsy, that death was caused by an enormous hypertrophy of the lingual glands, while the only case of its kind reported, certainly lends its support to this argument; another case was seen by McBride in a child of seven years.

Slight hypertrophy is rarely present before the fifth or sixth year, and marked hyperplasia before the twentieth year, while the majority of cases which present symptoms referable to the lingual tonsil are usually observed during middle life. In my own records, eighty per cent. of the cases in which hyperplasia was the cause of the symptoms for which the patient sought relief were between thirty and forty years of age, and in all there was strong evidence that the enlargement had existed for a considerable time before symptoms had developed. In a patient of sixty-four years, in whom movements of the epiglottis were hampered by the fibrous and, to a less extent, glandular enlargement, an appreciable growth at the base of the tongue had been noticed by the patient for at least thirty years. In a woman, eighty-four years of age, now under my care, there is well-marked hypertrophy with constant irritative cough, no other alterations being present that can be found to produce it. From a pathologic aspect, one of the strongest points in favor of its distinct identity is that hyperplasia or its constituent elements belong essentially to a time when both the faucial and pharyngeal tonsillar bodies have undergone retrograde metamorphosis, atrophy of these latter lymphoid masses, as a rule, being well under way at middle life, while the lingual tonsil is at its stage of fullest development. It is the exception, rather than the rule, to observe hyperplasia of the lingual tonsil at this age, with a corresponding condition of the faucial tonsils.

Clark believes hypertrophy to be most frequent between the age of eighteen and thirty-five years, while Bosworth's youngest case was a female of eighteen years and Lennox-Browne found it most frequent when associated with varix, between the twenty-fifth and forty-fifth year. Undoubtedly hyperplastic changes without associated venous alterations are initiated in a certain clsss of cases during the adolescent period when as evidenced in other conditions, lymphoid development is most essential, the symptoms not becoming manifest until years later, when forces both direct and indirect are then playing an etiologic part. One can hardly agree with Escat that the lingual tonsil in the child is not only fully developed, but also presents its period of maximum vitality and passes into a condition of atrophic change at puberty, to become at the age of twenty years so completely atrophied, as to be practically absent. Daily experience promptly refutes this erroneous view and while I believe that the lingual tonsil is developed and in certain individuals undergoes hyperplastic changes at an earlier age than is commonly considered, yet with the hypothesis of Escat accepted, one should not find the disease present after puberty except in exceptional cases. Bickel correctly interprets the essential facts when he states that the fourth tonsil is less completely developed in childhood than are the faucial or pharyngeal tonsils.

While the majority of observers are inclined to the opinion that hypertrophy occurs more often in females than males, there is a constantly increasing number of reported cases in which the sex is evenly divided. In my own cases sex exerted no influence in regard to the development of hyperplasia but the female presented more marked and varied symptoms than did the males. Hall expresses this forcibly when he says that at all events women more frequently complain of it than men. Roy, Schepp-grell (15 cases, 10 of which were females), McBride and others regard it as being most common in women, while Ellett, Seifert (106 cases, 58 men and 48 women) and Browne with 69 per cent. males and 31 per cent. females, demonstrate that they have seen more cases in males, or that the cases were evenly divided. Undoubtedly judging by the symptoms, it is more common to observe the condition in women, but if one will examine a number complaining of naso-pharyngeal lesions or even a series in which no symptoms referable to the upper respiratory tract are present, it will be surprising to find that the sexes are fairly divided or if there is appreciable difference the males will predominate. Escat explains this by saying that although hypertrophy is equally frequent in both sexes, the neuropathic reaction is more often expressed in females, thus giving rise to the erroneous impression that this sex is most frequently affected.

The factors concerned in the production of lingual hypertrophy do not differ in many respects from those acting on the faucial tonsils. The relation of gastro-intestinal disturbances is well defined in many cases, in 74 which I have seen with especial reference to this etiologic factor, fully 60 per cent. suffered from some form of dyspepsia often accompanied with fermentative changes. And in at least 35 per cent. of these a distinct relationship existed, not differing excepting in degree from the following case which is typical in this respect.

Mrs. A., age 35 years. Except a moderate hyperplasia of the lingual tonsil and delayed gastric digestion due to motor insufficiency, she is otherwise healthy. There are no symptoms from the hyperplasia except during an attack of indigestion which occurs about every six weeks, when the lingual tonsil increases to a sufficient extent to interfere with epiglottic movements and gives rise to a sharp, irritative cough. This disappears as soon as the diet is restricted and measures directed to the stomach trouble are enforced. Since reducing the glands with the cautery an attack of indigestion is no longer attended with throat symptoms.

Constipation as allied to gastro-intestional disorders plays a prominent part in the etiology but not as much in hyperplasia as in the associated condition of varix, this being present in individuals with disordered hepatic functions in which sluggish bowel movements are concomitant. In 67 per cent. of Brown's cases of varix with and without hyperplasia, there was constipation, while in my own cases, this factor played little or no part in the production of hyperplastic changes, but when the veins were enlarged it was an active contributing factor. In almost any chronic visceral affection there exists an undoubted tendency to varix, usually associated with some degree of glandular hyperplasia. I have recently examined ten patients with hepatic cirrhosis and chronic intestional disorders in which there was more or less obstruction of the venous system and in all there was lingual varix. In but four of these cases were any symptoms pertaining to this local condition manifested.

The rheumatic diathesis I believe plays an important role in aggravating the symptoms when hyperplasia has developed. Rheumatism per se apparently exerts no influence in the development of the hyperplasia and it is doubtful if the tonsil is involved as a prodromal symptom of an attack of acute rheumatism, as sometimes occurs in the faucial tonsils. With the predominence of varix, lithæmic and rheumatic diatheses do influence to a considerable extent the local lesion. In a man of fifty years, with mild rheumatic attacks coming on at indefinite times and of several years standing, enlargement of the superficial veins of the preepiglottic space was a constant accompaniment. The vascularity of the parts became so augmented as to cause considerable venous oozing; the condition subsiding but the veins still remaining more tortuous than usual, as soon as the brunt of the general attack had passed. A few cases will present strong evidence of the lithæmic diathesis localizing to a great extent the manifestations here, the glands being but slightly enlarged, yet the symptoms are out of all proportion to the local lesion. Treatment applied to the parts will fail, but only diatetic and constitutional measures directed to the general diathesis, will produce complete relief, yet when the foreign body sensation, cough etc., disappear, the physical appearance remains the same. These attacks appear at intervals and are especially liable to recur upon indiscretions in diet.

Rarely does syphilis play a part in the production of hypertrophy of the lingual tonsil and for all practical purposes it is not necessary to consider it in this connection. Allen is one of the few who have observed enlargement in hereditary syphilis, while Davis reported the case of a female of 39 years, in whom the faucial tonsils were almost destroyed, yet the lingual tonsil was simply enlarged. A similar case in a woman came under my care in which both faucial tonsils were destroyed by tertiary syphilis; the buccal tonsil at no time presented any evidences of the disease except hypertrophy, which diminished as the patient responded to constitutional treatment.

In childhood, the acute infectious diseases and especially those with throat lesions, have a direct predisposing influence in the production of future hyperplasias of the gland; diphtheria, scarlet fever, influenza and whooping cough being the most important in this connection. In my cases below the age of thirty years, 62 per cent. gave a history of one of these diseases.

The character of the food and drink exerts a distinctly unfavorable influence, both in the production of hypertrophy and in aggravating the symptoms when developed. Condiments, excessively hot and cold food, alcohol, etc., favor these conditions and from the relation of the glands to the deglutitory passage, they are necessarily influenced by such irritating agencies. The deleterious effects of poor nourishment, overwork, exhaustion, etc., while not noted as etiologic factors per se, are of sufficient import to be considered in relation to the symptoms in those suffering from the affection. This, of course, bears only indirectly by reducing the bodily reaction of the patient and differs in no essentials from the same influence when exerted upon other affections of the glandular system of the respiratory tract. In varix especially is this manifested and a lack of stability of the vasomotor system is one of the chief factors in its production. Dayton and Browne call attention to the frequent association of tortuous veins of the extremities, rectal hemorrhoids and lingual varix.

A most curious relationship and one pointed out by several authors is that which exists between hypertrophy of the lingual tonsil and varix, with the female generative organs. The tendency to venous engorgement at certain functional periods in the life history of the sex also manifests itself by engorgement of the pre-epiglottic space.

During menstruation, the lingual tonsil already large, becomes more so and produces a set of symptoms that are of but little moment or entirely absent in the interim. A typical case of this nature is recorded by Ellett in which acute enlargement of the tonsil was associated with dysmenorrhea, the symptoms produced by the swelling and especially the dyspnea, were so severe as to elicit considerable alarm. Hagen, a number of years ago, noted this relationship between the gland and menstrual irregularities, for it is in those especially with dysmenorrhea that severe symptoms are seen, while the milder cases with large pale growths at the base of the tongue and with the veins ramifying between the lobules, are found most frequently in amenorrhea with anemia and in the presence of a general nervous state. I have never observed such severe symptoms in this latter class as in the former, although it is common to find the tonsil much enlarged. Not only do the symptoms occur at the menstrual period, but venous oozing may, at irregular intervals, replace the catamenia. This is the prominent feature in the following case: A. F., of nervous temperament, now 32 years old, has suffered from dysmenorrhea from her sixteenth year. For the past three years, about twice annually the prodromes of menstruation would make their appearance, but instead of the usual flow, there would occur a venous oozing lasting for three or four days. The lingual tonsil was hypertrophied and the dilated veins were numerous and irregular.

As before mentioned, dysmenorrhea is the rule, amenorrhea the exception, and the tendency as regards regularity is rather in favor of frequent and excessive menstruation. Rarely does pregnancy exert any influence, but that it may exceptionally, is evidenced by a case seen several years ago. The woman was in the sixth month of gestation with her third child and was suffering severely from constant cough. No cause could be found except the lingual tonsil which was hypertrophied and the veins considerably varicosed. After cocainization there was immediate cessation of the cough, and as she refused radical treatment, it continued until she was delivered. when the symptoms disappeared, the tonsil diminished in size and no further trouble was complained of. The history was elicited that the cough had developed at previous pregnancies, with its subsequent disappearance after the birth of the child. The menopause is another epoch attended with the tendency to passive hemorrhage, venous engorgement and neural alterations; and at this period the same changes may be seen, more frequently, however, varix predominates.

As the etiologic factors exert an influence here the same as in hyperplasia of other lymph glands of the respiratory tract, we expect the same results modified only by the histological structure of the gland and its pecularlocation. As a result, the majority of cases in which hypertrophy predominates, present associated catarrhal lesions of the upper air tract, but the lesion of the lingual tonsil is often overlooked on account of its hidden situation and from the component follicles being scattered over a comparatively broad layer. Again the affection does not commence as an isolated acute inflammation, but being essentially chronic from the outset, the attention is not directed to the lingual region. The rest of the throat may present no pathologic changes in nature of overgrowth or venous congestion, although in practically all cases where the tonsil is of any magnitude, the anterior pillars are thickened and show some venous stasis. This condition may be seen without the laryngoscope and a further examination should be made to ascertain the condition of the tonsil when lateral passive congestion is observed.

The co-relation to adenoids is not borne out by my experience, the age at which the symptoms appear, the essential nature of the hypertrophy and the general type of the lingual lesions are all in opposition to this view and instead of being associated with hyperplasia of the pharyngeal vault as some would imply, I am quite sure that the reverse is true. Although the disease occurs more often than is supposed in children, the symptoms are not prominent and usually not recognized, as stated by Price-Brown, on account of the comparative insenitiveness of the throat during early life.

Rarely the acute parenchymatous inflammation may result in abscess. This form of abscess which is distinguished from hyperplasia only by the evidence of pus on evacuation and producing the same symptoms with little or no signs of inflammation, has been described by Mounier, two cases coming under his observation with symptoms so slight as to almost pass unperceived. Vitiated buccal secretion may, as claimed by Rualt, be a factor in the causation, this author reporting 120 cases in which he found buccal and dental lesions in 35. The secretions flowing over the parts and remaining in the fossa, supposedly render it more liable to inflammation than in those with healthy buccal cavities.

As to frequency, Arrowsmith found the lingual tonsil affected in 56 of two thousand cases; Scheppegrell saw 8 in one hundred cases of nasopharpngeal disease; Barnhill found it enlarged in twenty per cent. of cases and in one per cent. he found varix. Lennox-Browne in 17556 cases of nasopharyngeal disease found varix and hypertrophy in ten and one-half per cent. in hospital practice, and in his private patients this was increased to 28 per cent. In one-third of varix cases there was hypertrophy. In my own practice, both private and hospital, between fifteen and twenty per cent. of all patients have more or less hypertrophy of these glands, while two or three per cent. have varix.

Associated conditions acting as etiologic factors or as complications have been observed in a number of cases. Dmochowski believes in its frequent association with tuberculosis, with which I am unable to agree, although in one case seen a few weeks past, the patient a male of 32 years had always been healthy until two months before I saw him, when he complained of fullness at the base of the tongue. The lingual tonsil was enormously enlarged, but presented no evidences of tuberculosis until two weeks later, when he became a typical case of acute miliary tuberculosis, dying within another week. The lingual tonsil showed simple hyperplasia with no deep infection but its mucosa was covered with secretion containing enormous numbers of tubercle bacilli.

It may also be associated with irritable heart and neurasthenia, Gillot considering varix as indicating a predisposition to apoplexy. Severe paroxysmal dyspnea, cured by local treatment to the lingual tonsil has been reported by Mayo Collier; Casadesus reports a case of hypertrophy causing nocturnal asthma, cured by cautery and Shurly, Cohen and Swain state that it sometime leads to laryngeal catarrh but probably not often. Browne calls attention to two cases associated with diabetes and believes there may be a distinct relation between the local and general affection. Lewis observed several cases of goitre, complicating hypertrophy, the thyroid enlargement however was slight and was cured by treatment directed to the tonsil. In opposition to this Bowen examined six cases of goitre and did not find any disease of the post-lingual space, while I have examined four cases with this end in view and found no evidence at all of the condition. Gleitsmann cured a case of laryngeal vertigo by applications to the tonsil. Berens recently recorded a case in a young man in which the lingual tonsil resembled two almonds laid side by side and covered with mycosis so as to interfere with the epiglottis. Barnhill believes that functional heart disease is often aggravated and sometimes wholly caused by disease of the lingual tonsil.

Many cases even with large hyportrophies present no symptoms even when the growth apparently overlaps the epiglottis, while another class will present a varied array of sensations out of all proportion to the slight changes present. Barnhill believes that this depends upon two causes; the first that in highly sensitive cases, the slightest touch of a foreign body against the epiglottis will excite various reflex centres of the respiratory tract that is not possible in less sensitive persons. And secondly, the conformation of the epiglottis is such that instead of standing erect as it normally does, it curls forward against the base of the tongue and so impinges on the slightest enlargement of a single gland. Both these factors play an important part in the production of some of the symptoms, the neurotic element however predominating.

The symptoms are principally localized to the region involved or within its immediate vicinity and may be either direct or reflex depending to a great extent upon the temperament of the individual. For purposes of study they may be grouped under six classes, (a) cough; (b) foreign body sensation; (c) parasthesias; (d) voice changes; (e) hemorrhage; (f) respiratory distress.

Cough is the most frequent and constant of the symptom group resulting from the tonsillar changes. In children slight enlargement of the lingual tonsil is a common cause of cough, especially the barking cough of puberty, most marked when the child first lies down at night. It may be due to irritation of the epiglottis by the glandular mass, or in the absence of such mechanical cause, may be a neurosis. Rice in this country was one of the first to demonstrate the presence of this symptom as originating from the hyperplastic lingual tonsil. The cough is hard in character, sharp, metallic and ineffectual, occurs in the absence of other lesions of the respiratory tract, is unattended with expectoration as a rule, and may be temporarily made to disappear by anesthetising the tonsil. When due to enlarged veins, I have in two cases been able to produce its disappearance for a time, by contracting the blood vesssels with suprarenal extract. The irritation at the base of the tongue may not be of sufficient intensity to constitute a definite cough, but is of a hawking or hemming character. Again it may be violent, constant and hacking and it may seriously affect the general health of the patient. It may be associated with other symptoms and produce the impression that the patient is suffering from tuberculosis or other serious affection, as in a female, 25 years of age, reported by Foster, with anemia, anorexia, insomnia, constant hacking cough, dread of suffocation, neurasthenia, constant desire to swallow and profuse hemorrhage three or four times a day. The lingual tonsil was enlarged, varicosed and bled on the slightest touch. A perfect cure was effected by destroying the veins with the cautery.

Of the extra-pulmonary coughs, that from the glosso-epiglottic space is undoubtedly the most frequent and unless this portion of the respiratory tract be examined as it should in every case of cough, serious errors in diagnosis must ensue. Barnhill relates a highly instructive case in a female of 44 years, of delicate appearance, with considerable cough and frequent attacks of sore throat. No cause could be found except a varix at the base of the tongue, large enough to come into contact with the epiglottis. The cautery was used and complete cure confirmed the correctness of the presumption. The cough may be purely paroxysmal and only occur when the individual first attempts to eat, at times becoming so severe as to produce emesis. Very infrequently I have found it to continue after the hypertrophy had been removed, but further study would show that there still existed enlarged veins further forward on the base of the tongue and on removing these the irritation permanently ceased. Such a case was seen in a male, 37 years of age, with a large unilateral mass; the veins were not considered of sufficient import to require attention and the hypertrophy was alone snared off. Although this produced relief, a modified cough still continued, to be finally cured by destroying the remaining varix.

We should not depend entirely upon the statement of the patient as regards the seat of the symptoms and especially the cough, as the latter is frequently referred low down in the larynx or to the pharyngeal wall, when examination shows these parts to be normal while the lingual tonsil is enlarged and varicosed. Bottome reports ten cases which illustrate the severity of the symptoms in the presence of slight pathological change. There was a tendency to rapid tiring of the voice and hoarseness; the respiratory tract was normal except a circumscribed area of congestion at the base of the tongue, while the veins were prominent but not varicosed. Five of the patients had just recovered from bronchitis which was probably a causal factor, while in six, who were public speakers, it developed from a certain day when the voice was unusually tried. The cough was distressing and all were cured by passing a flat, broad electrode over the enlarged veins. In concluding his report the author correctly states that it is well to bear in mind that a comparatively trivial condition and not necessarily a greatly enlarged tonsil or varix, may account for a troublesome cough.

When the growth is extremely large, it is not uncommon to find the tip of the epiglottis firmly embedded in the mass. It has been suggested that the so-called winter cough might be associated with lingual tonsillar changes and while I have no notes bearing out this relationship, in many the features of the cough are similar and one can see no reasons why such a relationship should not exist.

Next in frequency to the constant hemming and cough, the patients complain of a sensation as if a foreign body was located at the base of the tongue. This may be of nervous origin in extremely neurasthenic individuals with a barely visible enlargement of a single follicle, or it may vary through different grades to the large mass as in a case seen by Ellett where the lingual tonsil was so large that he could see it without instrumental aid and was able to amputate it with an ordinary straight tonsillotome. This lump in the throat as the patient describes it, usually excites constant and futile attempts at swallowing with however little or no relief. In occasional cases with slight enlargement, but in which one or two of the the crypts contain cheesy masses similar to those seen in the common affection of the faucial tonsils, this foreign body sensation is especially vivid and is based upon the actual presence of the debris which acts as a definite extraneous substance. The foreign body sensation is prominent when the hypertrophy is in the median line, the interference with the surrounding parts being greater than when the lateral halves are widely separated. In another class, the tumor projects over the epiglottis, so that during deglutition the growth is pushed backward by the tongue and practically fills the lower pharynx. In these the trouble is to a great extent mechanical and the patient complains that the throat is growing together. Fortunately these cases complain of but few other symptoms and are readily relieved by appropriate surgical measures.

The neurotic element, is an integral part in the production of the various paræsthetic and hyperæsthetic phenomena so frequently observed even where there are insignificant alterations of the veins and glands. This is demonstrated by the absence or paucity of these symptoms when the nervous organism is well balanced but let there be the slightest depression or exhaustion and the symptoms stand forth prominently. The paresthesia may assume the most diverse forms and approach very closely to the border line of hysteria. It may resemble a feeling of intense cold at the base of the tongue; tenesmus is present, but is apt to disappear during meals to recur immediately afterward. There may be pain of a tingling, pricking or irritating character referred to the region of the hyoid bone, or when the masses are situated laterally, it will invade the aural region. In a few the distress will be located at the clavicle or between the scapula, while in others there may be a localized area of formication or a mere sense of weight and discomfort. Tenesmus may be so severe as to constitute a serious complication and be only dissipated by destroying the varix with which it is associated.

Globus hystericus so-called, is another symptom in highly sensitive women and frequently depends upon some lesion of the lingual tonsil as demonstrated a number of years ago by Browne and later by Kronenberg. While this condition is frequently considered hysterical in its nature, a large percentage will show varicose lingual veins and a closer study of these cases will clear up the etiology in not a few.

Pain may be due to direct pressure upon the filaments of the glosso-pharyngeal nerve, but is rarely observed, as close questioning will show that it is not true pain such as one finds in an inflammatory condition, but is merely an altered sensory stimulus. The arrangement of the nerves and veins is undoubtedly responsible for some of these paresthesias, for, as shown by Verneuil, Zuckerkandl and Foucher, there is a deep as well as superficial varicose condition of the venous supply and, in addition, the lingual nerve is accompanied by a satellite vein, thus when these blood channels are enlarged and tortuous, the sensory disturbance may be referred to a distance, producing such symptoms as glossodynia or even the imaginary ulcer of the tongue. A case of the latter coming under my observation was almost a mental wreck from the supposed presence of cancer of the tongue. There was no lesion at all of this organ and only after destruction of the tonsillar tissue was the patient convinced that her disease was not malignant. Occasionally one observes a case in which the chief symptom is a sense of constriction in the lower pharynx not exactly a tenesmus but more inclined to resemble the girdle pains of locomotor ataxia.

As from twenty to twenty-five per cent of pathological changes in the lingual tonsil occur in public speakers and singers, the question of morbid changes in the vocal apparatus in the professional voice user is one of paramount importance. Over-use of the voice in the subject of hyperplasia results usually in but a greater tendency to early laryngeal fatigue, but the chief factor in this connection is improper methods of vocal training and the abuse of the vocal function. In singers, the voice readily tires and there is constant fear that it will fail at any time and a peculiar hoarseness is experienced, which disappears after a few hours rest, but recurs with each singing exercise, or by the growth and dilated veins interfering with the epiglottis. Not only the singing, but also the speaking voice is incapable of responding to any sustained effort. When extreme hoarseness or complete aphonia takes place, the lingual tonsil can hardly be placed at fault, as it is usually due to some intercurrent laryngeal affection, the mucous membrane of the larynx being generally singularly free from catarrhal processes in the presence of a lesion of the buccal tonsil. In the cases which have come under my care in which the singing voice was affected, the majority did not complain to any great extent of other symptoms, this probably being due to the small amount of hyperplasia and the glandular masses being widely distributed, the epiglottis being affected to a less degree than is usual when the hypertrophy is larger. These effects also depend upon the character of the singing voice: in the basso, considerable enlargement may exist with no deleterious effects, while, in the soprano, where the epiglottis becomes more erect the higher the note sung, very little alteration will seriously impair the vocalization. Of course when the epiglottis is bound down, singing or lengthy speaking is totally out of the question.

Hemorrhage is the characteristic symptom of lingual varix and it may simulate hemoptysis or hematemesis, although its source rarely presents any difficulty to ascertain, as the dilated and tortuous veins often several millimeters in diameter are readily seen with the laryngoscope. In cases where the veins are affected as a local expression of a general condition, the vascular network may be so extensive as to cover the base of the tongue, the lingual surface of the epiglottis or even extend on the lateral pharyngeal walls. In these cases and in all instances of hemorrhage per os, careful examination of the lingual tonsil should be the imperative rule. Bleeding however, is rarely profuse, but there may be slight hemorrhage in the morning on arising, staining the secretions; the pillow may be stained at night as is frequently seen in children with adenoids, or it may occur imperceptibly during the day and being swallowed is unknown to the patient unless he realizes the saline taste in his mouth, or vomiting ensues with the presence of the blood in the ejecta. In the varicose condition associated with the increase in the cellular constituents of the gland rather than of the connective tissue elements, the secretion is increased and there is a feeling of fullness in the throat, due to the accumulated secretion and sometimes venous oozing. This feeling of weight continues until free bleeding takes place, when relief is obtained. Hemorrhage does not always indicate conjoint hyperplastic changes, as in many cases the tissue is normal or it may even be atrophied, but with a case of morning hemorrhage, one may confidently predict the presence of lingual varix.

While the bleeding is of little influence as regards the production of anemia except in insolated cases where the conditions have not been recognized, it may be but the local expression of some general and more serious condition, Dickson considers it diagnostic of thrombotic and hemorrhagic lesions of the brain in some cases and sometimes marked cardiac weakness. Kyle reports five cases with repeated attacks of slight spitting of blood, in all of whom the veins were dilated and sacculated. Joal has reported three cases of hemorrhage from this region and I have observed six cases in which the bleeding was severe.

Respiratory distress may be slight from partial interference with the epiglottis or it may be so intense as to cause great suffering from dyspnœa. When such is the case it is undoubtedly due to nerve stimulation and not to actual obstruction, unless the epiglottis is embedded in the mass. Boylan has reported an instructive case in which dyspnœa was a prominent symptom, while Gleitsmann and Farlow believe that many cases considered hysterical in origin, are associated with enlargement of the lingual tonsil, the former citing an instance of severe respiratory distress, which was cured by cauterizing the enlarged tonsil. Acute attacks of suffocation I have observed in two cases. The local application of cocain gave almost instant relief, probably by its influence upon the branches of the superior laryngeal nerve, whose fibers are distributed to this region.

Meyer has seen vomiting take place, while I have found nausea to be quite constant in varix and even in simple hypertrophy with accumulated secretion. The sense of taste is rarely impaired unless there is associated change of the papillae or the veins are much enlarged. In one case coming under my observation with both varix and fibroid change of the entire tonsillar area, the taste was entirely lost and only returned in a defective degree after thorough treatment. Spasmodic movements of the larynx, laryngeal spasm and torticollis have been seen by Browne while Villecourt reported a woman of thirty years, in whom intense dyspnœa suddenly occurred followed by cyanosis on the following day; the right arm was heavy, motion was difficult and there was partial anæsthesia, with the electrical contractility of the muscles diminished. In one week, reduction of the enlarged tonsil by local treatment produced entire disappearance of the symptoms. He believes the hypertrophy to have been the transgressor in this case, but although the reflex and direct symptoms produced by pathological alteration in this region are fairly numerous, it seems incredible that such an array of symptoms should originate from the buccal tonsil.

The pathological changes in the gland vary with the tissue predominantly affected. When the glands are enlarged in greater amount than the other tissues, they are apt to be bilateral and nodular, each lymphoid mass standing out prominently from the adjoining one; the tissues are soft and resemble the hyperplastic changes so commonly observed in the faucial tonsil. Again the growth may be very large if the connective tissue predominates and the single lobed gland on either side of the median fold may lap over the tongue as in a case reported by Thrasher. From the soft mammillated gland resembling a bunch of berries, which is characteristic of the lymphoid changes, there are many modifications to the other extreme, where the mass is usually unilateral, resistant to the touch and in many cases filling up the lingual space. In this form the surface is smooth and shining and in the absence of varix, pale in color, resembling the epiglottis as regards its tint. When both tonsillar masses are involved they are separated by a central furrow and on touching the tumor with a probe, isolated areas are found to be extremely sensitive, firm pressure producing cough or any of the reflex symptoms characteristic of the individual case.

In all forms of enlargement, the veins may be dilated, tortuous and arranged in an irregular fan-like shape over the base of the tongue. They are present between the individual masses and form a complete network, with here and there local dilatations or actual nodosites in which the blood stagnates, resembling to a striking degree, their analogue, rectal hemorrhoids.

The laryngoscope is essential to recognize the growth and no difficulty should be experienced in determining this fact, but when reflex and obscure symptoms are present great difficulty is often met with in establishing the connection. The probe in preference to the finger of the surgeon should always be used to determine the consistancy of the glands and to establish points of special tenderness from which both direct and reflex symptoms may originate. In order to ascertain the degree of mechanical pressure exerted upon surrounding tissue after the condition has been determined, a point which I have found of much practical value is to use a small mirror and examine the parts without disturbing the tongue or altering the normal relation of the tissues. The degree of vascular turgescence may be determined by the application of the extract of the suprarenal gland and this will also establish the relation of any symptoms that may be due to changes in the vascular channels. Cocain should never be omitted in determining the reflex nature of the phenomena in cases complicated with morbid alterations of the faucial tonsils or with other changes in the respiratory tract which obscure the diagnosis. Its value for this purpose being amply shown in a case coming under my observation with catarrhal changes of the bronchi and upper respirator tract. Cough was incessant and the patient a female, twenty-eight years of age, was incapacitated from work on account of the violent cough. The left lingual tonsil was enlarged and barely touched the epiglottis; cocain was applied and the cough ceased for the first time in months. The tonsil was then removed with permanent relief.

The treatment which I am in the habit of using, depends entirely upon the character of the pathological changes present in the individual case. If the tonsil is but slightly enlarged from hyperplasia, attention to the general health, the avoidance of alcoholic drinks, smoking, or irritating food are recommended and the parts are painted with tannin in glycerin several times weekly. This is usually satisfactory and the condition rapidly improves, attention also being given to the entire upper respiratory tract. Dilute hydrochloric acid, nitrate of silver in varying strength and any of the remedies of this class may be applicable in certain cases. While in a few where the symptoms are due to the anemic condition or neuræsthenic state of the patient, general treatment alone will do all that is required. Sajous found that the administration of small doses of mercury and iodide of potassium gave excellent results even in the absence of a specific history.

While general tonic treatment is always of value, yet one can expect little change in the glands from mild local measures or internal medication if the enlargement is at all prominent or impinges on the epiglottis. In the majority of cases operative measures are indicated and as the removal of the tonsil is attended with good results and little unpleasant after effects, it is to be recommended in suitable cases. The choice of instruments will depend to some extent upon the presence or absence of varix and the size of the growth. If there is a large fibrous mass, I prefer the cold wire snare. Very large masses may be removed in this way with but little pain and comparatively little bleeding. The galvanocautery snare presents no advantages when used here and has the serious disadvantage of burning the surrounding tissue with danger of the development of glottic œdema.

Winckler has devised a curved curette for this purpose which presents no advantages over other methods and even in experienced hands is not devoid of danger. The lingual tonsillitome with a long curve, is very efficient if the veins are scant and the danger of hemorrhage is reduced to a minimum. Its application is the same as that of the usual instruments for the faucial tonsils and it leaves a clean out surface which heals promptly with a minimum of discomfort to the patient. The galvanocautery with a properly curved tip and long shank, is useful in reducing small glands and it is the instrument preeminently adapted to destroy the varicose veins. In using it great, care must be taken to avoid injuring any tissue but that which it is intended to destroy. If the veins are small they should be seared with the cautery at a cherry red heat, while if large and tortuous they should be entirely destroyed. Only one or two veins are treated at each sitting and the inflammatory reaction is allowed to disappear before another seance is held; usually a week's interval between each cauterization is sufficient. In those cases where the tonsils are hypertrophied and varix is present, the veins must be first destroyed and the enlarged mass afterward removed by whatever method is deemed advisable. Care must be taken to avoid hemorrhage as far as possible, as it is extremely difficult to control bleeding in this location.

Roe's tonsillitome is a most valuable instrument and is readily applied by catching the ring under the growth and pressing downward, when the tonsil will project through the opening and the mass is removed by a clean cut. I have used this instrument in a number of cases, with the most satisfactory results. After any operation a certain amount of swelling and soreness ensues often lasting for several days. The patient should be given light, bland food, either liquid or semisolid and should allow small pieces of ice to dissolve on his tongue at frequent intervals, or if swallowing is very painful I have had excellent results with the dried suprarenal gland macerated in the mouth and allowed to remain in the back of the throat as long as possible.

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XXIII.

LITHEMIC NASO-PHARYNGITIS AND OTHER MANIFESTATIONS OF SYSTEMIC DISTURBANCES.*

By J. A. Stucky, M. D.,

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By the term lithemic pharyngitis is meant that type of pharyngitis having a close etiologic relationship to rheumatism or the lithemic diathesis. When we remember that the pharynx is more especially a portion of the alimentary tract, rather than of the respiratory tract, we can readily understand how it might be influenced by the lithemic diathesis, as this has its origin in the faulty metabolism occurring in the liver, or perhaps just as often to autointoxication caused by the absorption of by-products from the intestinal tract.

Of the authors of the recent leading textbooks on Laryngology and Rhinology—Kyle, Bosworth, Lennox-Browne, Ingals, J. Price-Brown, Ballenger, McBride, Shurley, Friedrich, etc.—the views of Kyle more nearly corroborate the clinical features as observed by me, than any other.

The disease may be defined as an acute inflammatory or congestive process, caused by acid urates which have not been eliminated by the proper channels. The excess is distributed to the structures especially concerned in secretion and elimination; irritation of the superficial structures follows, the marked vascularity of the pharynx rendering it particularly susceptible, the position making it more disagreeable to the patient because of use of muscles in swallowing.

The irritation is produced because uric acid in its various forms excites inflammatory reaction not only in the mucous membrane of the kidney, but in other mucous membranes. The excessive elimination of uric acid demanded of the kidneys and the inability of the organs to cope with the demand cause the deposit in other membranes. In lithemia, there may not be an excess of acid in the urine, but there may be retained and absorbed into the system the products of nitrogenous metabolism, and the local inflammatory process in the pharynx is most marked. The local manifestation of the diathesis may not be confined to the pharynx alone, but may exhibit itself in affections of the laryngeal, nasal and gastro-intestinal tract, without other constitutional symptoms.

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*Abstract of paper read before the Middle Section, American Laryngological, Rhinological and Otological Society, St. Louis, Feb. 22, 1902.

A person whose vitality is below par is as susceptible, if not more so, to an attack, through over-indulgence in eating and drinking, as by exposure to cold. The attack causes primarily no lesion, except that which is forced upon it by the irritation of the acid in the blood. There is no distinct pathologic alteration, this being a local manifestation of a systemic condition.

The exact nature of the diathesis in gout, rheumatism or lithemia has not been settled, yet the clinical phenomena and alterations in the mucous membrane are practically the same. The attack may come on gradually with slight tendency to headaches, pains in muscles, especially of the neck, or it may be ushered in suddenly, without apparent cause known to the patient; when the latter is the case, the first symptom noticed is sensation of fulness and accumulation in throat, which is increased by swallowing. There is constant desire to swallow, which is attended with much discomfort, the throat having a rigid, stiff feeling and being hot, dry, and irritated. The movements of the individual with an aggravated lithemic throat are almost characteristic, with each movement the head assuming a different position.

The attempt to clear the throat produces a sensation of pricking with a sharp instrument, showing that the affection is superficial. There is only slight elevation of temperature, the chief manifestation being soreness of throat.

The systemic disturbance as indicated by the temperature, pulse and inflammatory condition are not sufficient to account for the pain and discomfort. The redness and swelling of tissues are more marked behind the posterior pillars of the fauces, while other portions of throat are but slightly congested. In most of the well marked cases the uvula was rigid, slightly swollen, congested or edematous, and pain in the ear was produced by the slightest attempt to swallow. In almost every case there was a pricking and itching sensation, accompanied by feeling of tightness and constriction and of the constant presence of a foreign body. In several the acute local manifestation in the pharynx was followed by articular rheumatism, and I am convinced that the first indication in many instances of approaching articular rheumatism is felt in the pharynx. A number of cases can bring on an attack in a few hours by eating freely of meats and sweets and drinking fermented wines.

The primary cause of lithemic pharyngitis, as well as many cases of spasmodic rhinitis or vasomotor coryza, is internal, and the exciting factor in precipitating the acute attack is not more frequently exposure to cold, than over-indulgence in eating and drinking. These cases, as a rule, are overfed and underworked and lead a sedentary life. A starving man neither takes cold or suffers from lithemic or rheumatic trouble. "An overfed person is worse off than one who is underfed because the overfed body is taxed to dispose of what connot be appropriated, and when not properly disposed of, remains only to be an element of danger." (J. C. Shepard)

Treatment.—The disease being a local manifestation of a systemic disorder, local treatment amounts to practically nothing except for its psychologic effect, and when used must be of the simplest nature. Sprays, gargles, etc., tend rather to increase irritation. Any application containing astringents, cocain, or similar drugs, is contraindicated. In the beginning of an attack, if inflammation is marked and the tissues swollen, thorough cleansing of the pharynx, tonsils, post-nasal space and anterior nares, with hot alkaline and saline solutions by means of lateral and postnasal sprays affords marked relief by removing the retained viscid secretion. After this is accomplished no further local treatment is needed except a gargle of hot mentholated alkaline solution for its soothing effect.

The cause of the trouble, originating within the body and being either retention and absorption of acid urates or autointoxication caused by the absorption of by-products from the intestinal tract, our treatment must be directed to the removal of the cause. Increased metabolism by stimulating the liver and regulating the action of the bowels, also the diet and habits of the patient, not only will prevent the further formation and retention of uric acid in excess, but will stop the autointoxication from the intestinal canal.

The drugs indicated are those that will hyperalkalinize the blood and increase its solvency for urates. Sub-alkalinity of the blood indicates diminished oxidation, and consequently retarded nutrition, both being favorable to the formation of uric acid in the body as well as to the growth of pathologic microorganisms, in this way favoring autointoxication.

The causative systemic factors to which attention is first directed are: 1. Gastro-intestinal. 2. Cutaneous. 3. Insufficient physical exercise. In the beginning of an attack a full dose of calomel followed by salines, repeated often enough to thoroughly cleanse the intestinal canal, is the first indication to be met. The salicylates and lithium salts combined with minute doses of pilocarpin, repeated until free diaphoresis takes place, give speedy relief. The skin should be kept in order by daily bathing and friction so that its reaction shall be prompt. Most lithemics have so sluggish a cutaneous surface that it practically does not eliminate. Daily exercise with restricted diet and regulation of the hepatic and gastro-intestinal functions, give most favorable, prompt and lasting results.

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XXIV.

A CASE OF CONGENITAL FISTULA OF THE EXTERNAL NOSE.

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This case is reported, first, because an error was made in diagnosing its nature, and consequently, because of ineffective treatment, the condition was made worse. The patient was a young woman aged twenty-four, married. At the age of fourteen, she noticed a swelling over the dorsum of the nose, coming on very gradually, and which, after about three months from the beginning, was the size of a large pea. About this time, edema over the forehead and eyelids began. The skin immediately over the swelling became reddened and the hitherto well demarcated swelling became more or less diffuse over the surrounding tissue. The physician who was called in at this time made a diagnosis of abscess of the bridge of the nose, and recommended opening the abscess immediately. After the operation, edema and pain disappeared, and the discharge, which she said was very thick, also disappeared. A fistula remained, however, which was subject to attacks of inflammation. She gives, also, a history of several recurrent attacks of inflammation over the bridge of the nose, accompanied by edema of the eyelids. As you see by the photograph, there are now two holes: one immediately over the lower third of the nasal bones and the other one above the cartilaginous portion of the tip. By passing a Eustachian bougie from one to the other, you can see that they communicate. Both of these openings continuously discharged a sebaceous material and, occasionally, pus.

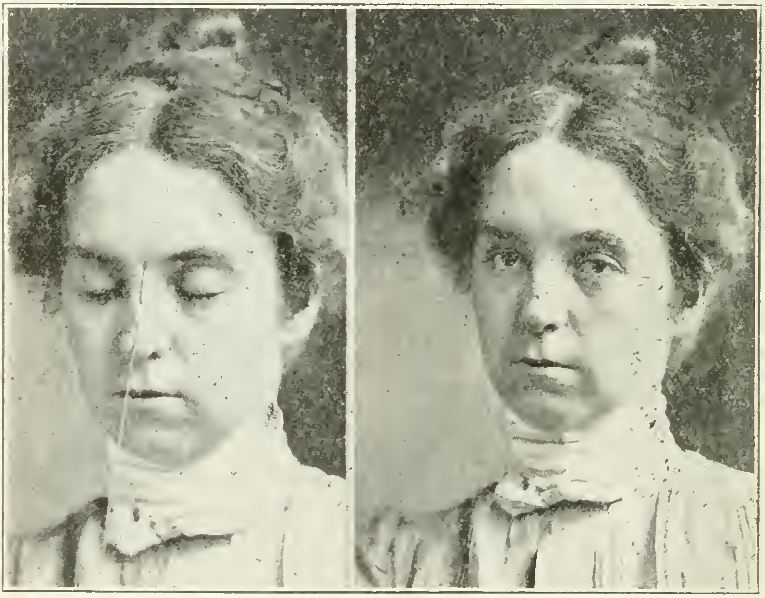
From the upper portion may be seen protruding the ends of a few hairs, which apparently have their origin lower down in the canal. The patient has become markedly morbid over her trouble, which is largely due to a physician having told her that the disease was due to rotten bone within her nose.

As she objected to operation, I began with electrolysis for the purpose of destroying the membrane lining the fistula. I used about twenty-five milliamperes at two or three sittings, but, as the pain was very severe, and no appreciable result was obtained, she consented to an operation, which was performed under a general anesthetic. The fistula was laid open and found to be lined with a smooth, shining membrane, having the appearance of mucous membrane. After diligently searching out the upper portion of the fistula, a branch was discovered which dipped down beneath the left nasal bone. This, however, was blind and, at the time I saw it, had no opening into the interior of the nose. The tissue, on account of its delicacy, was with some difficulty dissected out; especially was it difficult to dissect it from the cartilaginous structures of the floor. After thoroughly dissecting, the sharp spoon was used in order to remove any remnants that might be left, and the wound closed up with sutures. Healing occurred by first intention, but after about three weeks a small swelling appeared in the lower portion of the wound, which broke of its own accord and emitted a sebaceous material mixed with pus. This readily yielded to applications of trichloracetic acid, since which time the patient has had no further trouble.

This, then, is evidently a fistula resulting from a congenital dermoid, a somewhat rare condition, as applied to the bridge of the nose. Dr. Robert Krieg, in his "Atlas der Nasen-Krankheiten," depicts several cases of this condition.

The first is a congenital dermoid, in a girl three years of age. The tumor was noticed directly after birth. It was roundish in form, about the size of a hazelnut, not freely movable, but adherent to the deeper layers of tissue; it was covered with healthy integument and situated in the middle line on a level with the canthæ. The tumor increasing in size, it was removed one year later by the patient's attendant. In this tumor, the interior was healthy and contained only sebaceous matter, no hairs having formed.

The second case was in a woman aged twenty-six, who had a roundish tumor, size of a large pea, which had been present since birth and was situated on the dorsum of the nose. There was no noticeable adherence to the substratum. In its center was a slightly reddish depression, out of which, on squeezing the tumor, some sebaceous matter could be pressed. The patient refused all treatment, as the tumor does not inconvenience her in the least.



The third case (Plate II.) was one of congenital dermoid fistula. History: Woman, aged twenty-one, with nine brothers and sisters, suffering from nothing similar; also, no harelip in family. The patient assured the attending physician that the condition of the nasal dorsum was congenital. According to her mother's statement, she was under treatment at various times during the first three years of life. The patient remembers that since her sixteenth year, yellow, puriform drops could be squeezed out of the tumor. Where the nose had previously had a slender form, it now began to swell over the nasal bones. This occurred in December, 1897, a year previous to observation. In twenty-four hours the swelling extended upward to the hair border, on a level with the eylids, so that it was only possible to open the right eye but slightly and the left one not at all. At the same time, severe pain, fever, and general weakness were so great as to confine the patient to the bed. Eight days later the tumor had decreased to the size which it now presents.

Present condition: Situated exactly in the middle line, 5 cm. below the lower border of the nasal bones, is a swelling forming a smooth level in the nasal skin, with raised edges. It commences below as a shallow depression, further upward, becomes deeper, and ends posteriorly in a tunnel, out of which one sees some fine black hairs projecting. The region of the root of the nose appears asymmetrical, in consequence of the swelling of the left nasal bone, which projects forward to the left, falling off abruptly in that direction. It is soft, but not distinctly fluctuated. Near the left internal canthus the skin is tender, reddened and thin; on pressure, the tumor discharges, out of the tunnel-like opening, sebaceous matter. On introduction, the probe first penetrates the superficial opening immediately beneath the superficial skin, and then enters the swelling in a direction upward and to the left, until it reaches a second bending in the middle line which penetrates under the nasal bones into the nasal septum.

Operation: A director is passed through the fistula and an incision is made over the skin, from above downward. Circumcision of the grooved depression, followed by detachment with the raspatory from below, excepting that part which branches off and lies deeper down below the nasal bone; this later it was found necessary to cut off with the galvano-cautery. The left nasal bone shows no atrophy from continuous pressure. The patient made an uneventful recovery, and is in good health at the present moment.

Microscopic examination: The fistula was found lined with epidermis of the pavement-shape variety, containing isolated hair-follicles and very numerous sebaceous glands. The sub-epidermal tissue shows, here and there, aggregations of round cells. Sections through the deeper layers of the excised piece show connective tissue next to the more granuloid structure. They contain a few mucous glands, and curiously enough, numerous, irregularly, dispersed giant cells, and aggregations of same into groups.

The fourth case was one of congenital dermoid fistula in a girl of eighteen, who, since could remember, always had a small protuberance in the center of the nasal dorsum. She gives a history of having knocked her nose against a door when she was about three years old, at which time an opening formed which discharged matter. Two months ago the fistula was opened in another hospital, and scraped with a Volkmann's spoon. After three weeks it reopened and commenced to discharge again. At present there is, in the middle, directly under the nasal bones, extending in a vertical direction, a fistula five mm. in length, out of which sebaceous matter may be squeezed. Extensive cauterization of the fistula with caustics, brought about permanent healing.

Krieg says that the dermoid fistulæ of the nasal dorsum do not belong, from an embryonic point of view, to the arrest of development of the facial clefts, but owe their origin, according to Witzel, to the imperfect apposition of the two tuberosities, which, rising on both sides of the median nasal furrow, approaching each other in the center of the face, ought to form the cartilaginous nose and septum by coalescence. The first of the four cases, was from the beginning a closed dermoid, but evidently on the point of forming a fistula. In case III, the fistula was congenital, whereas, in case IV, the fistula did not open and discharge until the patient had attained her fifteenth year.

In my own case there was at first a congenital dermoid, which undergoing inflammatory changes, was mistaken for an abscess. Subsequently, a fistula formed, and so remained until she came under my observation. There was very slight pressure atrophy of the lower portion of the nasal bones and of the cartilaginous structure over the dorsum. It is to be noted that all of the cases occurred in females.

XXV.

EMPYEMA OF THE FRONTAL SINUS: SOME OBSERVATIONS ON ITS TREATMENT.*

By George L. Richards, M. D.

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The observations herewith presented are based more on my own experience than on any exhaustive survey of the literature of the subject and the reports of cases and form, therefore, probably only a very limited view of a very large subject; since the arc of the circle which any one man's experience subtends is necessarily very small; nevertheless, the sum total of human knowledge is made up of individual contributions.

A brief review of the anatomy of the frontal sinus seems necessary in order to deal properly with the subject of treatment. The frontal sinus varies in its position, in size, and in the thickness of its walls. It is not developed in early childhood, but appears about the age of puberty, probably from an extension of the ethmoidal cells into the frontal bone, and attains its full development around the twenty-first year. The manner of its development may account for the great variation in its size, and for the relation which it bears to the anterior ethmoidal cells.

Normally, the most dependent portion of each sinus opens downward into the nose, through a duct called the fronto-nasal opening. This duct varies in diameter from one-twelfth to three-sixteenths of an inch, and in length from one-half to three-quarters of an inch. Its outlet is in the infundibulum, a term applied to the upper and anterior portion of the hiatus semilunaris, where it is bounded externally and behind by the bulla ethmoidalis, in front by the processus uncinatus of the ethmoid, internally and above by the anterior third of the middle turbinate bone.

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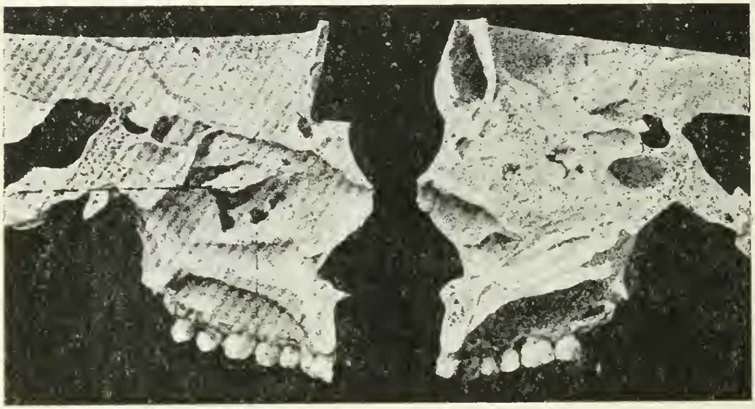
*Presented before the annual meeting of the American Laryngological, Rhinological, and Otological Society at New York City, 1901.—From the American Journal of Medical Sciences, March, 1902.

The natural openings of the antrum of Highmore and those of the ethmoidal cells are in the hiatus semilunaris, but behind the infundibular opening of the fronto-nasal duct. Between the frontal sinus and the infundibulum, the fronto-nasal duct is separated by thin walls from the anterior ethmoidal cells, while in front of it are usually several small cell spaces, called by Hartman the frontal cells of the ethmoid; of these he describes three—an anterior, an outer, and a posterior. These cells have very thin walls, sometimes almost as thin as paper. The di-

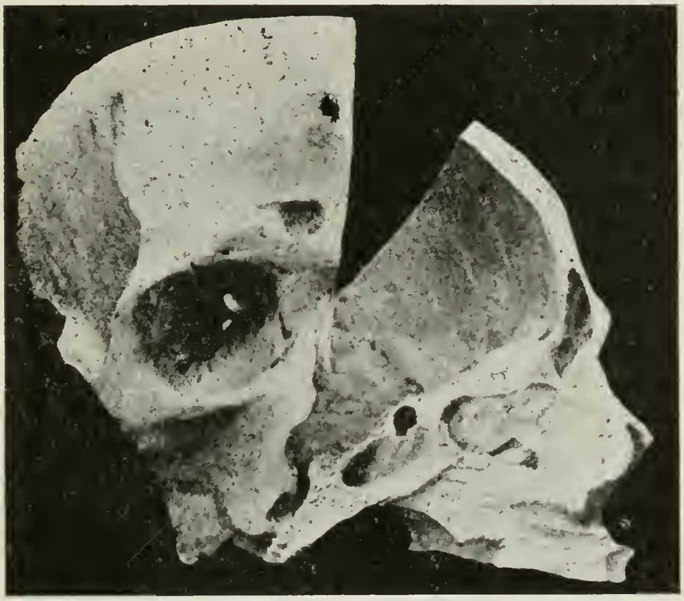
Fig. 1.



Right and left halves of the same skull. In the right there is a good-sized frontal sinus, the walls of which are thicker below the supra-orbital ridge than above, but an opening below the ridge would have given easy access to the fronto-nasal canal, and at the same time have been at the most dependent part of the sinus. In the left half, the inferior tubinate and the anterior end of the middle turbinate have been removed. The natural opening into the maxillary antrum is indicated by the vertical dotted line, while above the processus uncinatus is plainly visible. The horizontal dotted line points to the infundibulum, which is prolonged into the frontal sinus and the fronto-nasal canal. In this case a probe or canula could probably have been passed into the frontal sinus. (Author's collection.)

rection and position of the infundibulum and fronto-nasal duct being dependent upon the size and development of all these boundary structures, it is easy to understand how difficult it may be in many, or even in most instances, to satisfactorily reach the sinus, for purposes of exploration or treatment, through the natural opening.

Fig. 2.



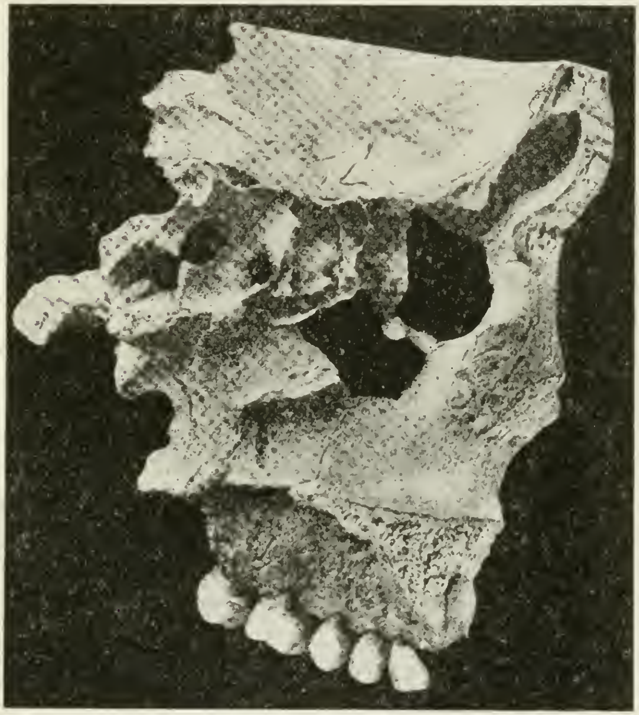
Two halves of the same skull. In the right half there is no frontal sinus above the supra-orbital ridge, diploic bone being found in its place. Just underneath the ridge, at the inner angle, is seen an opening; this leads to a small sinus which communicates with the nose through the usual fronto-nasal canal, and is large enough for an empyema. The sinus is present in the left half. It is about the average in vertical extent, but outwardly extends but a short distance. In this specimen opening over the roof of the orbit would have come upon the dura. (Author's collection.)

The anterior wall of the frontal sinus is relatively thick; its posterior wall less so, but still quite thick; while its thinnest wall is over the orbit, a portion of the roof of which it forms, and at which point the wall may be very thin. Its extension outward and upward is very variable, being on an average from three-fourths to one and one-fourth inches above the fronto-nasal opening, and about the same distance outward. It extends backward over the roof of the orbit about half an inch. These are average measurements, but by no means constant. The two sinuses do not usually connect, but may do so; this very rarely occurs, except as a result of disease. They are also variable in their relation to one another, one sometimes being much larger than the other, or one sinus may entirely fail. The division line may be so far to one side as to allow of the wrong sinus being opened at an operation, or it may run diagonally, as in one of my specimens, and there may be septa dividing the sinus into compartments.

What danger has the collection of pus in these sinuses? What are the chances of cure and the best methods of bringing this about? As to the danger, it seems to me that so far as life is concerned this is relatively small. This statement I regard as correct, in spite of the fact of deaths being reported from chronic empyema of the frontal sinus; since anatomic anomalies, secondary infection after operation, or unusual virulence of the pus would account for these, as reports seem to show. We have all discovered cases of chronic empyema of the frontal sinus, with a constant discharge of foul pus, in which the general health was really very good, and the danger to life, by the presence of the pus almost nil. I recall one such case, in which the pus discharge had probably existed for years without any great disturbance of health. Relief was sought on account of the nasal obstruction and the foul odor. Polypi were cleared out, the middle turbinate removed, and this failing to cure the sinus was later opened externally. It was found to be filled with pus and a low grade of granulation tissue, which latter bled most freely on being curetted. After the thorough removal of all diseased membrane recovery was prompt and uneventful, and there has been no recurrence of the trouble.

If one considers the anatomic relationship, and the fact that nature usually seeks an outlet through the path of least resistance, it will be found that there can be no outlet which nature is likely to force except downward, or downward and forward, or outward through the wall of the orbit; that is, nature will be most apt to force her way out in the region of the ethmoidal and frontal cells, or through the roof of the orbit, in which latter place it is probable that spontaneous evacuation sometimes takes place.

Fig. 3.



Specimen somewhat broken, but showing a good-sized frontal sinus, with very thick anterior wall. The ethmoidal spaces are very large, having extremely thin walls, and communicate with the cavity of the sphenoid. All of the turbinates and the infra-orbital wall have been removed. In case of chronic empyema, the entire frontal, ethmoidal, and sphenoidal areas might have been affected. In that case no single operation would have been thorough enough to have eradicated all of the disease. It is specimens like this which probably account for the long and unsatisfactory course which empyemas in this region sometimes take. (Author's specimen.)

Aside from the symptoms of pain and headache in the neighborhood of the sinus, and the complaint of nasal obstruction, the diagnosis is made by inspection of the discharge, which appears underneath the middle turbinate or between it and the septum, and by exclusion of the other possible sources from which this pus might come. Pressure upward on the wall of the orbit will usually elicit pain, though this is not constant. Disease of the antrum and of the sinus frequently coexist, and in most cases it will be necessary to make an exploratory incision into the antrum to exclude that as a possible source of the pus. I have several times opened into the antrum in the canine fossa, under cocain, to determine the presence or absence of pus. Puncture underneath the anterior end of the inferior turbinate is equally efficient for diagnosis. When antrum and sinus are both diseased it is likely that one has infected the other. The antrum is usually the first to be operated upon under these conditions, as the discharge from the frontal sinus may take care of itself after the antrum is healed. If the exploratory puncture of the antrum has been negative, we then have the anterior ethmoidal cells and the frontal sinus as the sources of the pus. The diagnosis here may possibly be very difficult. Transillumination, while by no means decisive, has seemed to me of some value as a diagnostic measure. It certainly is so far as antrum disease is concerned; and in two of my frontal sinus cases the information furnished by transillumination was positive and accurate.

In the text-books one is taught how to carry a probe through the hiatus semilunaris and the infundibulum directly into the frontal sinus. In practice, with a swollen mucous membrane and an enlarged middle turbinate, the whole of which may have been bathed with pus for a long time, and where polypi may also be present, this may be extremely difficult or even impossible. The observer may think the probe is in the frontal sinus when it has passed into some one of the frontal or anterior ethmoidal cells, or even when it is in the superior meatus.

The first thing to do, then, in any case in which pus is evident, is to clear away any obstruction, such as polypi, that may be present. As a rule, it will be necessary to remove the entire anterior portion of the middle turbinate. This also applies to those cases in which the suppuration is acute—such cases as are not infrequently seen following the grip, and in which the drainage is obstructed by the swelling of the mucous membrane and its underlying connective tissue.

These acute cases tend to get well if the drainage is free enough; and on their first discovery the middle turbinate should be removed and the drainage made as free as possible. After this is done it is frequently comparatively easy to find the track up to the frontal sinus, and with the aid of a silver or hard rubber tube, properly bent, to wash out the sinus, and in a relatively short time to bring about recovery. The proper curve of the tube is obtained by first passing a long silver probe and then copying its curve. In cases of this class the question of an external operation ought seldom to occur, and the diagnosis is usually not a difficult one to make or to differentiate from ethmoiditis or antrum disease, since the attack is acute, is accompanied by pain over the eyes and forehead, and the whole clinical picture is one that admits of comparatively little doubt as to the trouble. I have recently had an acute case of frontal sinus empyema, in which after the removal of the middle turbinate it was easy to pass a curved canula into the sinus. Daily syringing produced a cure in six weeks, and after some months there has been no recurrence.

In that large number of cases in which the purulent discharge has lasted a long time, and in which the formation of polypi has been brought about from the constant drainage of the pus over the structures, and all of the adjacent ethmoidal cells are very likely more or less involved, the question of treatment becomes less easy to decide. These cases are of all degrees of severity. An example of one of the severer ones may make my meaning clearer.

Some three years ago a patient was referred to me by an oculist on account of some trouble in the nose following typhoid fever. She had complained for several years of severe headaches, for which she had been treated by many physicians. She finally drifted into the hands of the oculist, who, finding that glasses were of no avail, examined the nose. To his surprise, he found that breathing through each nostril was difficult, and that there was a constant discharge of pus from each side. Thinking that the cause of the headaches might be in the nose, he referred her to me for treatment. Treatment was commenced by first removing at several sittings large numbers of mucous polypi from each nostril. I then made exploratory punctures into each antrum without finding any pus. The pus discharge diminished very much from the left nostril, but was no better on the right. I next removed each middle turbinate. Still the headaches were about the same, and the discharge of pus was constant; nor did syringing into the sinus, which was done fairly easily on the right side, less so on the left, seem to accomplish much. I then did the external operation on the right side, in the angle formed by the eyebrow and the root of the nose, and opened freely down into the nose. Fluid pus, without granulations, was present. Thinking that I had now accomplished drainage by external and internal means, I allowed the wound to close in a short time, and did not carry any drainage-tube down into the nose.

There was improvement for a while, but the pus discharge continued, and after a few months I again operated, this time on both sides, in the same locality, and found pus in each sinus. The opening into the nose was enlarged with large curettes, and iodoform gauze wicking passed through, followed in a few days by good-sized fenestrated rubber drainage-tubes passed clear into the nose; these latter were retained for four weeks. The external openings closed; the openings into the nose, in spite of their size, became so small that a silver probe could not be passed through without pain; still the pus discharge continued.

After a few weeks more she was again operated upon. This time the curette was used with greater vigor, so as to break up all of the cells in the region of the outlet; and larger drainage-tubes were put in each sinus. The amount of pus at this time was pretty small in the right side, but she had been complaining greatly of pain in it. Healing took place as before. The tubes were retained several weeks, but still the pus continued. She was allowed to go home, but as the pain was complained of as much as before, and the pus discharge was considerable, she was operated on again two months later.

This time the incisions were made higher up on the forehead, above the supra-orbital ridge, with the hope that the curette could be passed down into the nose more directly and the operation be a thorough success. It was found that there was still pus in the left sinus, but that the right one had completely closed and had become filled with new osseous growth. This fact would seem to harmonize with the statement of Hajek, that the pain is sometimes worse on the sound side, since, in spite of the healing, the pain did not disappear. At no time did the two sinuses communicate. The wound again healed, and I was under the impression that I had accomplished a cure as relief was obtained for a time; but something over a year later she came to me with the statement that there was still some slight pus discharge from each nostril and an occasional swelling at the inner angle of the right eye, with considerable throbbing pain in the region of the temples, especially on the right.

At her own request she was again operated on. Both frontal sinuses were found to be closed with new bone, and were therefore not opened throughout their whole extent. The natural opening into the nose was reopened and made as large as possible, and all anterior ethmoidal cells that could be reached were broken down and destroyed. The right antrum was opened, but contained no pus. An attempt was made to open the right sphenoid sinus, but it was not very successful. Large drainage-tubes were carried down into the nose, and the external openings closed. The throbbing pain ceased, and the general pain after operating was less than usual. The rubber tubes were removed in five days. On the right side a curved silver tube was carried from the external incision down into the nose and retained three weeks. She is improved in every way, though still under treatment, and the pus discharge from the nose has not entirely ceased. That an absolute cure has been obtained is doubtful, as improvement has followed all previous operative procedures. Considering the number of operations the cosmetic results are very good.

I am inclined to think that in this case I have had an empyema not only of the frontal sinus but of all the adjacent ethmoidal cells, possibly extending as far as the sphenoid, and that the earlier operations failed to open sufficiently for efficient drainage some one or more of these cells; and if I were to draw any lesson from my own failures in this particular instance, it would be to suggest that when an external opening is made the anterior ethmoidal cells should be destroyed with the curette as far back as it can be made to reach when used from above; and if the cutting portion is kept backward and outward, or outward and forward, there is but little risk of injuring any important structures. If turned toward the centre line it will be possible to injure the lamina cribrosa, which is from 14 to 20 millimetres only from the root of the nose and about on the same level, though sometimes deeper.

[Since the above was written, the pus discharge in this case has ceased, except from the left nostril, in which it was found that the pus came from the antrum, this having been infected by the discharge from the frontal sinus. This antrum had been free from pus at two former operations, and at the last one was not opened as I did not expect to find any pus therein.

Drainage has been effected by opening underneath the inferior turbinate and washing out the cavity every other day with 1-8,000 corrosive sublimate. The result has been that all symptoms have disappeared, and the patient appears well. Should pus continue to come from the antrum for any length of time, the radical operation through the canine fossa will be performed.

This case and my later experience would lead me to suggest that in all frontal sinus operations the antrum of the corresponding side be explored in every instance.]

The foregoing is an extreme case; but can any of the chronic cases be cured by intranasal operative methods? Hartmann thinks it will but seldom occur that they can. In the chronic cases, how long shall the operator be content with having secured fairly good drainage; for it is only exceptionally that the element of severe pain comes in, as in the case just cited? According to Hartmann, the external opening should be made when after a fair trial of intranasal drainage the discharge continues and there is still pain. Most of the chronic cases get a certain amount of relief after the removal of the middle turbinate, and are then somewhat loath to consider the question of an external operation, fearing the deformity and having a certain dread of the length of time required for healing; though the latter, I am sure, would be very much shortened if a sufficiently large opening were made down into the nose at the time of operation; and the deformity, when the operation is done at the inner angle of the eye, under the supra-orbital ridge, is nothing. The washing out of the sinus, even after the removal of the turbinate, is still difficult, since the outlet is small; and if polypi or granulations are present in the sinus no cure will ever be effected until an external opening is made. Various solutions are used for syringing into the sinus. Personally, I have had better results from corrosive sublimate, 1 : 10,000 to 1 : 15,000, than from peroxid or any of the other solutions usually advocated. To be sure, the corrosive sublimate irritates sound tissues and is sometimes painful, but it does more good than any substitute. It should be followed by an alkaline douche through the nasal cavities and pharynx, to offset its irritant effect upon the sound tissues. Protargol, in 2 to 5 per cent. solution, has proved of service in the hands of several observers.

I should say, then, after spending a reasonable length of time in the attempt to gain proper intranasal drainage by syringing and douching, the question of an external operation should be presented to the patient and he be allowed to make the choice. He will be very likely to ask if we know that there is pus in the frontal sinus, and if a cure will result; and to both of these questions we may be in doubt as to the answer. Hartmann reports a case in which, after opening the frontal sinus, no pus was found therein, but on further exploration pus was found in the frontal cells. I once opened the frontal sinus in a case of pus discharge which I had at first supposed to be purulent ethmoiditis, having found no pus on exploratory puncture of the antrum. The pus discharge not disappearing after removal of the middle turbinate, I concluded that the sinus must be infected. It was opened and no pus found. Healing took place in four or five days, and no unpleasant results ever came from the operation. The pus without doubt came from some unopened ethmoidal cells or from the frontal cells in the region of the fronto-nasal canal.

Will a cure result? This is the other question certain to be asked. Sooner or later, yes; but how long it will take will depend on the extent of the bone involved; and this is a question difficult to determine before the sinus has been explored. Diseased bone is notoriously slow to heal so long as any portion of the disease is left, since so long as there is any left it is liable to break down and form pus. Then, again, I have found the tendency of the canal in the nose to close to be a constant source of difficulty. To illustrate:

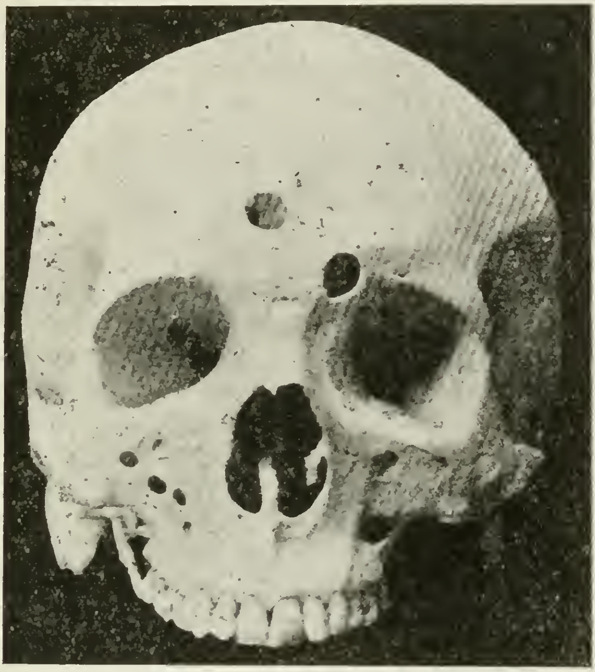
A case of empyema of the antrum was opened, cleansed, curetted, cured. Pus appeared in the nose. The middle turbinate was removed and the discharge found to come from the frontal sinus. The sinus was opened thoroughly, and, having in mind previous experiences, the opening into the nostril was made, as I supposed, sufficiently large. A drainage tube was retained two weeks, and the opening then allowed to close. Five weeks later there was a swelling at the region of the external wound, and the sinus, or at least a portion of it, was found filled with pus. Under cocain the walls of the sinus were thoroughly curetted and an endeavor made for weeks to bring about a healing, but without avail. An ether operation was again done, more bone cut away, the sinus curetted in its whole extent, and the opening down into the nose very much enlarged, a drainage tube reinserted, and the opening allowed to close. The case was discharged, apparently well, but returned some weeks later with pus as before. The sinus was curetted, drainage, irrigated with corrosive sublimate, and at last healed. This last time I was able, with the aid of a silver tube, to prevent the opening into the nose from closing until the bone was apparently healthy. Some months have now elapsed without any return of the trouble, and there is no deformity.

In another somewhat similar case, which also combined antrum and sinus trouble, a gold tube was made and kept in the external wound for a long time, until the last vestige of pus had disappeared.

So far, then, as the external operation is concerned, it must be allowed that the question is by no means so simple as it at first might be supposed, since the so-called radical operation is not always certain to result in a cure.

At a meeting of the Laryngological Society of London in February, 1901, this subject was discussed, and the weight of the argument seemed to be in favor of the more conservative methods of dealing with these cases intranasally. Dr. St. Clair Thomson thought that we should be slow to claim a complete cure in these cases, and recorded a case in which, although the operation had been done two years before, the patient still had to syringe her nose

Fig. 4.



Specimen with good-sized accessory cavities, in which operation in any of the places recommended by various authors would have reached the sinus and allowed abundant room. On the right side is indicated the site for the opening above the orbital ridge and also the openings for the operation in the orbital roof. On the same side is indicated the point for the operation below the orbital ridge. In this specimen there are several septa in the sinus floor and large frontal cells; and had there been an empyema it might have been necessary to do one of the radical operations in order to entirely eradicate the disease, though the opening below the ridge could easily have been enlarged sufficiently to give access to the entire sinus area. Below on the left side is indicated the site for operation on the maxillary antrum, while the small openings on the right side show somewhat of the boundaries of the antrum. (Author's collection.)

three times a day. The pus, he thought, had come from the ethmoidal cells rather than from the frontal sinus, as the fronto-nasal duct was quite obliterated before he allowed the sinus wound to heal. This, however, can only confirm my statement that in the chronic cases we probably usually have to deal with an inflammation of the ethmoidal cells as well as of the frontal sinus.

At this same meeting, Dr. Herbert Tilley said that in cases in which only a drop or so of pus showed itself at the end of each fronto-nasal canal he did not consider himself justified in advising a radical operation, and that the nose should be merely cleansed once or twice daily and nothing else.

Sir Felix Semon replied in answer to the question, "When ought one to perform a radical operation in these cases?" that it was a great achievement to be able to diagnose the cases better and to treat them more successfully than in the past. Over a practice of twenty-five years devoted to special work he had seen plenty of these cases and, so far as he knew, very few of them had come to grief prior to the discovery of the modern forms of treatment. There had been a few cases with threatening symptoms, but they were and are very few. He had seen cases in which suppuration still continued after the performance of the radical operation, further operations were necessary, and the patient finally was not much better off than before. In his opinion, it is a matter deserving very great consideration as to whether or not the discovery of a little pus coming from the frontal sinus demands a radical operation in every case; and the surgeon is bound to tell the patient that the big operation occasionally leaves some deformity.

Dr. Lambert Lack thought the indications for external operation are rather indefinite. If the symptoms are of only slight purulent discharge, he thought the case best left alone. The middle turbinate should first be removed, the anterior ethmoidal cells opened, and the approach to the infundibulum thoroughly cleansed. If this failed he operated externally, endeavoring always to obliterate the sinus, as the only certain method of obtaining a cure. He thought that many cases reported as cured by intranasal operation are really only cases of ethmoidal cell disease.

As a whole, this discussion seems to me to be leaning rather to the extreme of conservatism. It is certainly much more conservative than the other extreme, viz., the operation which Hartmann describes, of removing the whole of the anterior wall of the frontal sinus (Die Verödung der Stirnhöhle durch Abtragung der ganzen vorderen Wand). This would doubtless produce a cure, but it is a question whether our American patients would care for the operation. Hartmann himself is opposed to such an operation on account of the great deformity which results, and says that it does not seem to be necessary, as healing can be brought about through the establishment of a free communication with the interior of the nose.

In the final analysis, the question of operation must depend in each individual case upon symptoms, such as recurring attacks of pain and cerebral irritation, which suggest dangers to the organism from septic absorption; and upon the judgment of the operator and the confidence reposed in him by the patient. In many persons the question of confinement, or the length of time they will be kept from work, will have a large influence, and they will prefer to endure the discharge of pus which is not producing alarming symptoms rather than be kept from their daily vocation long enough to produce a cure. I have such a patient at the present time. The daily washing keeps her comfortable; there is no retention of discharge; and she thinks she cannot afford to lose the time required for the radical operation.

In another case removal of the polypi and middle turbinate has improved all the conditions and the radical operation is declined on the ground of lack of urgent symptoms. The drainage is good, the pain on pressure over the eyebrow has disappeared, the odor though still present is much less, and there is but little discharge. As this patient is over seventy years old, and his cardiac conditions are poor, I am limited to intranasal methods of treatment.

[Since the above was written this patient has apparently perfectly recovered under intranasal syringing of the sinus with 1-8,000 bichlorid solution. The odor, pain and discharge have entirely disappeared.]

If the external operation is decided upon, where shall the opening be made, and by what means? The question of scar is one not to be lightly passed by, and I am decidedly opposed to such an operation as Hartmann describes, in which, after first making an incision and cutting away the bone in the line of the eyebrow, but underneath the ridge, he then opens at right angles down to the eye, lays aside the soft parts, and cuts away the frontal cells, taking care that he does not remove any of the important muscles or soft parts of the eye. 'This is undoubtedly effective in laying bare the sinus, but leaves an unnecessarily large opening. He does this only when the simpler operation has not opened the cells sufficiently or brought about a free enough communication with the nose.

From my own experience I prefer always to make the opening between the supra-orbital notch and the root of the nose and underneath the ridge. Whereas the wall of the sinus is comparatively thick at this point, the sinus itself when opened is as roomy as at any place, and the bone opening is easily enlarged upward as far as the upper border of the ridge, and outward, so as to give a sufficient amount of room to enter with a fairly good-sized curette and explore every part of the region. While the frontonasal canal is easily accessible at this point, it is at the same time also the most dependent portion of the sinus. So long as the upper border of the supra-orbital ridge is left, the resulting deformity is practically nothing, as the new growth of the eyebrow takes care of the scar.

Before beginning the operation the post-nasal space can be plugged, to prevent the swallowing of blood. A string should be attached to the plug, one end being brought out through the free nostril and the other out of the mouth. After shaving the eyebrow and properly preparing the surface a circular incision is made from just inside the supra-orbital notch and along the lower third of the eyebrow as far as the root of the nose or a little below. The periosteum is laid back, the bone bared, and an opening made down to the sinus at the centre-point of the incision. The sinus being opened and explored with the probe, the external opening is still further enlarged as in the individual case may seem necessary. When this is done sufficiently a probe can be passed downward into the nose through the natural opening and its direction noted. This opening is then enlarged with the curette, so as to give all the room that is needed, more of the bony wall of the sinus being cut away if required and in whatever direction needed; and, bearing in mind my own experience, I should urge upon the operator to make a larger opening into the nose than he thinks he needs—in fact the largest opening possible, especially backward and outward, so as to avoid any danger of injuring the lamina cribrosa. Use small curettes at first, and larger ones if needed; those with curved shanks are preferable. The whole area of the sinus that can be reached is to be curetted and its ramifications followed up. The extent and vigor of the curetting will depend upon the condition of the mucosa and the presence or absence of granulations. As far as possible, all of the ethmoidal cells in the immediate vicinity should be opened· When using the curette in the fronto-nasal canal or in the ethmoidal region the little or index finger should be kept in the nostril as a guide, the middle turbinate having been in all cases previously removed.

I have tried gauze wicking of good size as a means of keeping the fronto–nasal canal open, but do not like it as it is very painful to remove. Drainage is best attained by means of rubber tubes slightly fenestrated, one end of which presents at the external wound and the other out of the nostril. These may be changed every other day, the new one being readily attached to the old one by carrying a needle with a long thread twice through each one and leaving the threads, cutting out the·needle at the eye. The old tube is then drawn down, the new one follows it, and the threads can be cut off. The advantage of putting the thread through twice and then leaving it long is, that if there is any interference on the way and the rubber pulls the threads might pull out and the following tube be lost; but if the threads are sufficiently long the following tube will not be lost, and the first one can be drawn back in case the second tube will not follow, and a smaller tube can then be used. These tubes should be retained as long as may be necesssry, certainly two or three weeks. After that time if a tube is required it is better to use one of silver, properly curved. At the time of operation a stitch is put at each side of the wound, leaving an opening sufficiently large for the drainage-tube. In cases which have lasted but a short time, if the opening into the nose is very large, it may do to close the external wound; personally, I prefer to keep it open for a while, when if the case progresses well the tubes can be removed and the opening allowed to close. As the incision is a curved one, when the tube is finally withdrawn the tendency is for the opening to close perfectly, leaving only a slightly depressed scar, completely covered by the eyebrow and not noticeable in any of my cases except on close inspection. When the opening is made on the forehead above the ridge there is more likelihood of an unsightly scar if it cannot be closed at once and perfect apposition obtained; there is also more likelihood of a depression than when the opening is made at the angle of the eye. The only possible advantage of opening above is that the opening down into the nose is rendered straighter. I think, however, that this advantage is more theoretical than real. If the operator were certain that he had removed all of the diseased mucous membrane, and that the outlet into the nose was sufficiently large, the external wound might be closed at once; of this, however, one cannot be sure.

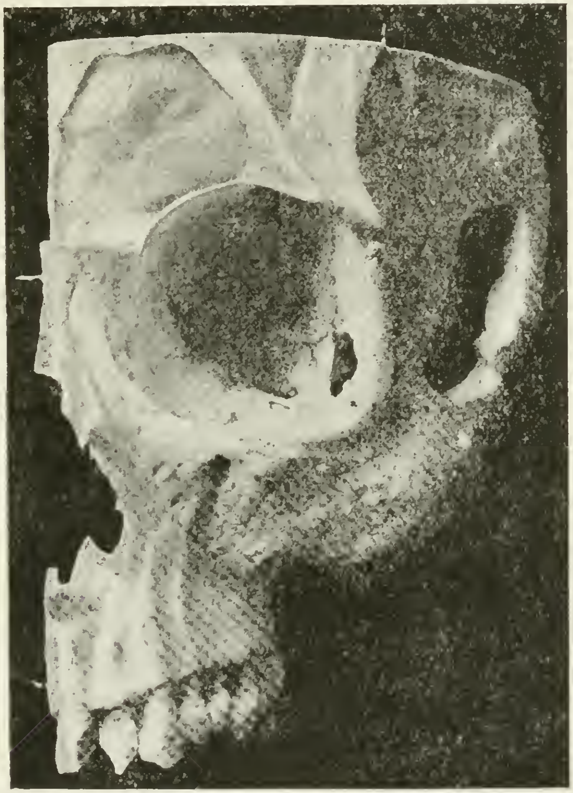
In case the cavity is filled with granulations, Hartmann would take off the frontal wall. As already cited, one of my cases was as full of granulations as it could be, and yet it healed in less time than any of the others; so that it does not seem to me to be necessary to take off the frontal wall.

Considerable swelling of the loose tissue about the eye always follows any external operation, but lasts only a few days.

The after-treatment will depend upon how thoroughly the disease can be eradicated at the first operation. In many cases recovery will be prompt and satisfactory; in others final healing will be tedious and long delayed. The pus discharge may come from some of the ethmoidal cells, which in long-standing cases are almost always involved. Re-operation may be necessary, even when the first operation was apparently absolutely thorough. The principles which must be our guide are, remove all the diseased bone and mucous membrane that it is possible to remove, provide free drainage, and have as little remaining deformity as possible. The time required for a cure varies, according to the degree of severity of the disease, from a few weeks to several months.

Besides the operations described there are a number of other procedures for the cure of empyema of the frontal sinus which bear the names of their originators, and which I shall briefly describe, since they appear frequently in literature, and there is sometimes some confusion of terms.

Fig. 5.



Specimen showing large frontal sinus extending backward and outward over the entire roof of the orbit. In case of empyema, operation underneath the supra-orbital ridge and between the supra-orbital notch and the root of the nose would give ready access to the whole interior of the sinus and to the fronto-nasal canal as well. (Author's collection.)

The Operation of Nebinger-Praun. The essential point of this is the wide opening of the anterior frontal sinus wall. An incision is made from the naso-frontal suture along the orbital border of the supra-orbital notch. The anterior bony wall is laid bare, whatever is necessary, first of the nasal and then of the frontal bone, being chiseled away. A vertical incision, 4 to 6 cm. long, is next made, following the border of the frontal vein. Bone is now chiseled away corresponding to the breadth of the sinus, the horizontal portion being laid bare. After the horizontal portion is laid bare, the purulent contents removed, and the wall curetted, the opening into the nose is enlarged. Nebinger recommends draining the sinus at the place of junction of the horizontal and vertical cuts.

The Operation of Jansen. The chief feature of this operation is the removal of the inferior wall of the frontal sinus, and, in very large sinuses, partial resection of the anterior wall. A curved incision is made underneath and parallel to the eyebrow from the lateral border of the orbit to the side wall of the root of the nose. · After loosening the periosteum the superior wall of the orbit is laid bare. The inferior wall of the sinus is next removed. In the case of a very large sinus the inferior border of the anterior wall is also removed. The diseased mucous membrane and granulation tissue are removed with sharp curettes.

While this method gives free access to the floor of the sinus, the opening in the nose is not so readily attained as by some other methods. Having seen some cases some time after the Jansen operation, I am not especially pleased with the ultimate cosmetic results; in one case particularly, the eye on the operated side seemed to sag.

Method of Ogston-Luc. To open the sinus and ethmoidal cells an incision is made along the inner third of the orbital wall, extending about 1 cm. until the root of the nose is reached, the periosteum laid back on one side toward the forehead and on the other from the orbit, and the sinus opened a little to the outward from the median line and mostly above the orbital ridge. After opening the sinus, an opening is next made into the ethmoidal cells, and after establishing a wide communication between the sinus, and the nose a drainage-tube is carried down into the nose and the external wound at once closed.

This operation has many advocates, and is frequently performed. When the external wound is at once closed it is probable that the resulting scar is very light. In those cases where it becomes necessary to keep the external wound open for a time—and these are quite common—it does not seem to me likely to produce as good cosmetic results as the operation I have described.

Method of Czerny. Czerny makes an osteoplastic flap, enlarges the opening into the nose, tampons with iodoform gauze for a sufficient length of time, and as soon as healing is brought about lays the skin flap, with its attached lamella of bone, on the side of the original wound. This is said to produce good results, without deformity.

Method of Kuhnt. This consist in the removal of the entire anterior frontal sinus wall and the entire diseased mucous membrane, including the upper portion of the fronto-nasal canal. A horizontal incision is made along the inner two-thirds of the supra-orbital ridge; then a vertical upward incision is made at the inner angle of the first incision. After pushing back the soft parts and the periosteum, the entire anterior wall of the frontal sinus is removed with chisel and bone-cutting forceps. The bone edges are left smooth and all septa in the sinus are removed The entire mucous membrane is next removed from the sinus and from the upper portion of the fronto-nasal canal. A drainage tube is then inserted and the external wound closed with sutures. The after-treatment consists in the daily syringing of the sinus with sublimate solution. The stitches are removed on the sixth or seventh day.

Röpke has modified this operation so as to make a wide passage from the floor of the sinus to the ethmoidal cells, clearing out the latter as far as necessary and then packing the cavity with iodoform gauze. When both sinuses are affected the vertical incision is made in the middle line, and the anterior walls of both sinuses, together with the division line and the prominent portion of the nasal process of the superior maxilla, are removed.

The cosmetic results are said to be good, there being marked depression in only one of Röpke's cases. Double vision was present in three cases, but passed away after a while. Unless the mucous membrane is entirely diseased it would seem almost superfluous to remove every portion of it, since it must all be reformed again for the proper nourishment of the interior of the sinus unless the sinus is to be obliterated. In this latter case I fail to see how there can help being some deformity after such an operation.

Operation of Killian. This consists in chiseling and curetting the frontal sinus, with temporary resection of the nasal bones.

Operation of Spiess. Spiess opens the frontal sinus intranasally with the drill and the end of a flexible shaft, under the X-ray.

This operation would seem to be a rather difficult one to do, and not entirely devoid of danger, since where there are so many sinuses and cells the X-ray picture might easily mislead. I have seen some of the X-ray pictures of the operation in Dr. Spiess' clinic. Both Dr. Spiess and Prof. Moritz Schmidt regard this method of operating as valuable and certain, since it gives a large opening into the sinus without external opening. So far as I know, this method has not as yet been followed by other operators, at least to any extent.

It would be much simpler if these various operations were described and known according to their anatomic characteristics rather than by the the names of their real or fancied originators. Too many things in medicine and surgery are described in this manner. It seems to me that it is sufficient, and far better, to describe a procedure as such, rather than A.'s, B.'s or C.'s. The reader is then enabled to know what is being described without first looking up a biographical dictionary of medicine.

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XXVI.

TEMPERATURE AFTER MASTOID OPERATION—ANALYSIS OF 100 CASES.

By Thomas J. Harris, M. D.,

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EYE AND EAR HOSPITAL.

What significance is to be attached to an elevation of temperature following a mastoid operation? Does it suggest an incomplete operation with retention of pus or of diseased areas of bone, or have our manipulations been lacking in thorough asepsis; or is there, what might be termed for want of a better name, a normally elevated post-operation temperature, due to the same causes, i. e., bacteria, which originally produced the temperature? Every one of us has doubtless asked himself these questions in connection with his mastoid work, and perhaps has had no little anxiety in some important case on this very account.

The danger of generalizing from one's own limited experience is a matter of common observation. The writer has therefore thought it worth while to consult the records of the last 100 cases operated upon at the Manhattan Eye and Ear Hospital. Information was sought along the following lines:

(1). The stay in hospital after operation.
(2). The temperature after operation.
(3). The number of days of elevated temperature.
(4). The day of highest temperature.
(5). The character of the temperature curve.

In each case the record was carefully examined, and only simple, uncomplicated cases selected. This threw out all cases with brain or sinus complication; all with gastro-intestinal or bronchial complication; and any cases in which the notes showed unusual or excessive discharge from the wound. It is to be conceded at the outset that in some instances the records were not complete, and some systematic cause, such as that proceeding from the stomach or bowels, overlooked; and yet we believe they are as accurate as we can hope to secure in any large hospital.

An analysis of these 100 cases yielded the following results:

1st. In only one case was there a perfectly afebrile temperature.

2d. The average length of stay in the hospital after operation was 14.8 days. This does not mean, of course, that healing took place in that time, but that the case made such favorable progress toward recovery that it could be transferred to the outdoor department.

3d. The average duration of the post-operative temperature was 6.65 days, the range being from 2 to 19 days.

4th. The greatest elevation of temperature occurred in 56 cases, or over one-half, on the second day; in 29, on third day; and in the remaining 15, on the fourth day or later.

5th. In 28 the highest elevation ranged from 99-100 F
“ 39 “ “ “ “ “ 100-101
“ 23 “ “ “ “ “ 101-102
“ 6 “ “ “ “ “ 102-103
“ 4 “ “ “ “ “ 103-104

In brief, in 90 per cent. of the cases, the elevation of temperature did not exceed 102; and in 67 per cent., or over one-half, fell under 101.

These statistics suggest, among others, the following comments:

(a). They represent the work of not one, but at least ten surgeons.

(b). The notes of the house surgeon refer repeatedly, even in the cases with highest temperature, to no complaint from the patient but that “he slept well”—“wound looked healthy,” etc. The fact that the highest elevation of temperature so generally occurred on the day following the operation decisively disposes of the theory that it was due to retention of pus and need of dressing; and while it is a common view to ascribe it to acute infection from the bowels, and to expect a fall from the use of a cathartic, it rests on no secure basis.

In the writer's opinion, the most plausible explanation is that it is of bacterial origin. This could, with a fair degree of confidence, be asserted if a series of cases, sufficiently large, could be studied bacteriologically, the secretions of the wound being examined for a number of days as carefully as is done in many of our clinics before operation.

In this connection the much broader question is raised of our ability to secure complete and absolute asepsis in our operations, and perfect sterility in our mastoid wound. In all work in our New York hospitals, we aim at this, and every surgeon would resent the accusation that he was not surgically clean and aseptic in his methods. We are cognizant of others, however, who do not employ such methods, and do not pretend to do so, and yet seemingly secure the same results, in the same period of time.

Is it possible that there are minute areas, adjacent to and connecting with the mastoid wound, as in the aditus, which do not permit of complete disinfection?

Several writers, among them Politzer and Dench, refer to the posibility of post-operative temperature.

There is always a suggestion that it is but a continuation of the temperature before operation, which is in line with the bacterial origin just mentioned. It is true, however, that we are constantly meeting cases of mastoiditis with little or no elevation of temperature; and not a few of the cases studied in this paper showed their first marked elevation after operation.

One point more—out of the one hundred cases the temperature continued in 56, or over half, less than a week; in 10, three days; in 18, four days; in 12, five days; yet in the remaining 43 it continued for periods varying from six to nineteen days. In 30 an elevation of temperature persisted as long as they remained in the hospital.

It is to be further noted that in the cases with long continued temperatures, there were many in which after the third or fourth day the temperature ranged between 99 and 100, with no high fluctuations, or fluctuated from normal in the moring to 99 at night.

Without further dilating on the various phases of this question, which permit many suggested considerations, we are warranted, we believe, from our study, in making the following conclusion:

(1). Post-operative temperature of moderate amount is customary in mastoiditis.

(2). The cause of it has not yet been definitely determined.

(3). Without other symptoms, it is without significance and should not be a source of anxiety.

XXVII.

AN UNUSUAL CASE OF NASAL GRANULOMA.*

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Blanche B., aet. 14, white, consulted me in May, 1901, for nasal stenosis and catarrh with great secretion. Patient anemic, appetite poor, headache, condition generally depressed. Eczematous eruption around ears and on eyelids. Father healthy, mother cachectic—is under treatment at present for uterine disorder, sarcoma suspected; one grandfather died of tuberculosis.

Nasal examination revealed a granular neoplasm almost completely filling both nasal fossæ and extending into the postnasal space and down the posterior and lateral pharyngeal walls. It was also distributed over the posterior surface of the velum palati and uvula. No involvement of larynx. The granular like growth was pale in appearance and bleeding slightly on moderate contact with the probe—never bleeding spontaneously. Flowing over the surface of the growth was a thick, mucopurulent secretion, which was very acrid, causing excoriation of the skin of the nostrils and upper lip. There was no spontaneous pain, in fact, the principal symptom was difficult nasal respiration, which she had begun to notice for about two months previous to her visit to me. The distribution of the neoplasm was general over the mucous membrance lining the nose, but it was thickest along the floor of the nose under the inferior turbinates, and on the posterior thirds of the inferior and middle turbinates, the septum, the nasopharynx and post-pharyngeal wall. The portion occupying the nose was soft in consistency, and easily removed with cold snare and sharp curette leaving a smooth, non-ulcerating surface, which healed kindly and rapidly. The hemorrhage was very slight during operation.

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*Read by invitation before the Eastern Section, American Laryngological, Rhinological and Otological Society in New York City, March, 1902.

A portion of the growth was submitted to a microscopic examination by Dr. Chas. Grandy, of Norfolk, Va., and he reported that the tissue was made up of small round cells—mostly mononuclear, held together by very little stroma, no tendency to formation of scar tissue, no tubercles, no tubercle bacilli, and that it was more like granulation tissue than any thing else.

Despite the absence of any suspicion of syphilis in the family history or the patient, I determined to try anti-syphilitic treatment for a few weeks, and at first it seemed to be having the effect of diminishing the size of the growths and reducing the amount of secretion. This good effect, however, seemed to be but transient, so I began removing the masses with snare and curette, putting the patient at the same time on cod liver oil and iron. As nasal respiration became better established the health improved greatly. Every vestige of growth that could be seen was removed from the nasal cavities, and as much from the nasopharynx and oropharynx as I could get, and the patient was allowed to return to her home feeling almost well again, her only remaining sympton being the viscid discharge which had only partially disappeared. I should state that the scaly eruption disappeared under the specific treatment. Six months later the patient returned for examination. Had experienced no more trouble with breathing, and health had steadily improved. Examination, however, revealed a considerable reappearance of growth on floor of nose and posterior one-third of turbinates and septum. Arsenic exhibited and growth removed as before, and cauterants applied to base. This treatment extended over a period of several weeks, when she was again allowed to return home for the holidays. She returned to me three weeks later, and I found that some of the tissue had recurred over the cauterized area and that her health was again beginning to fail. As before noted, I am inclined to the belief that the growth is of syphilitic origin, or possibly a form of lupus. It has not seemed to me to present malignant characteristics.

XXVIII.

LARYNGEAL CHOREA—REPORT OF A CASE.*

By James Francis McCaw, M. D.,

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OCULIST, AURIST AND LARYNGOLOGIST TO THE CITY HOSPITAL AND JEFFERSON COUNTY ORPHAN ASYLUM; FELLOW OF THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, ETC.

The case which I present for your consideration is one of interest on account of the extremely rare occurrence, as well as from a diagnostic standpoint. The following is a brief report:

L. B., female, aged 15, consulted me in December, 1901, for a constant persistent cough. Mother is of a highly nervous temperament, otherwise the family history is negative. The patient has always been considered a delicate child and allowed to do as she pleased. Began to menstruate about one year ago. The periods have been very irregular and scanty. Near the time of menstruation, one year ago she was suddenly attacked with complete aphōnia, lasting for two weeks, at the end of which time her voice returned as suddenly as it had disappeared. Following this, and until the advent of the present trouble, she has suffered from numerous attacks of "sore throat," tonsilitis and nervousness, which incapacitated her for school work. Three months ago she contracted a cold in the head, a few days later a sore throat, slight cough and soreness in the chest with some hoarseness. There was no expectoration and the condition subsided in the course of ten days, excepting the cough which has continued ever since with varying degrees of severity. There are days when the interval between the paroxysms will be lengthened and each paroxysm not so severe. If she becomes excited, irritated or annoyed the cough is aggravated.

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*Read before the Eastern Section of the American Laryngological, Rhinological and Otological Society, at New York, N. Y., March 1st, 1902.

Her mother says that the peculiar feature about the cough is that it is almost incessant from the time of rising in the morning until retiring at night, but the child will go to sleep and have a perfect night's rest without the slightest indication of a cough. The condition became so persistent and annoying to both the family and physician, that they were afraid she was suffering from some grave organic disease. So successfully had the cough baffled the best efforts of the family physician that he sent her to me with the possible diagnosis of laryngeal tuberculosis. In his letter he stated that in spite of the prolonged treatment the condition had remained about the same.

Examination: Patient is fairly well nourished, anemic, below the average intelligence, and distinctly neurotic. The cough above referred to has the characteristics of beginning with a low growl and terminating with a distinct loud sharp bark. These paroxysms come on at varying intervals from one to three or five minutes, each paroxysm covering a period of only a few seconds. There are choreic twitchings in the muscles of the arms and shoulders, and the voice is quite hoarse. The inferior turbinate bodies in each nostril are in a state of venous engorgement, dependent, I think upon a small amount of lymphoid tissue in the pharynx. Slight hypertrophy of both faucial tonsils.

Laryngoscopic examination was easily made and revealed a perfectly normal larynx, excepting a slight congestion of the vocal cords, which could be accounted for by the long continued irritation. In further study of this organ, the vocal cords were seen to oscillate between abduction and adduction, this spasmodic condition ending in a forcible adduction of both cords. The freedom with which this examination could be made and action of the vocal cords studied, were to be wondered at, in view of the apparent excessive nervousness of the patient. Heart and lungs negative. I observed this case for one week when she returned home, and have heard nothing from her since.

The points which have impressed me most in studying this history are the importance of exhausting all means at our command in arriving at an accurate diagnosis, as bearing upon the subsequent management of the case and the ultimate result; and, further, the great value of the laryngoscope in accomplishing the end in this particular class of cases. I can readily understand how any physician, be he ever so careful, may be misled in his diagnosis and fail in his efforts to relieve, unless he is able to study the larynx through the medium of the laryngoscope and satisfy himself, beyond doubt, of the spasmodic and incoordinate action. This is doubly true in cases where there are few accompanying symptoms, especially an absence of choreic twitchings in other parts of the body which might suggest the possibility of a connection, but this manifestation, we are taught, is absent in the majority of cases.

The true nature of chorea is still obscure, as all cases thus far examined by pathologists have failed to furnish any lesions which can be regarded as essential, and we are therefore at the present obliged to classify it as a "neurosis"—or a disease producing functional disturbances for which no anatomic basis is known. In view of this limited knowledge of the pathology, treatment is to a great degree symptomatic, unless we discover some point of reflex irritation, which must, under all circumstances, be removed if we would be successful in our efforts. This has been clearly demonstrated in a case reported by Dr. J. A Stucky, where the patient, a young woman 23 years of age, had suffered from this peculiar barking cough for four or five years. She had been subjected to dilatation of the cervix uteri, later the removal of both ovaries, an operation for relief of vesical calculi and, finally, excision of hemorrhoids. By chance a solution of cocain was applied to both nostrils for the relief of a violent acute rhinitis, when, much to his surprise and to the comfort of the patient, the annoying cough was relieved as long as the effect of the cocain lasted; subsequently both inferior turbinals were cauterized throughout their entire length with chromic acid, which was followed by complete relief.

The treatment applied in my case was rest, regulated diet, and liq. potassii arsenitis in increasing doses, and for the week she was under observation there was a perceptible improvement in her symptoms, and I have every reason to believe that she made a good recovery.

The diagnosis of laryngeal chorea, I think, is justified, first, from the age, sex of the patient and the neurotic history; secondly, from the characteristic noisy, dry bark, which continued with little interruption during the day and ceased during sleep, associated with choreic twitchings in other portions of the body and, finally, from the laryngoscopic findings.

XXIX.

ENORMOUS NASO-PHARYNGEAL SOFT FIBROMA—WITH A GENERAL DISCUSSION OF THE DIFFERENT VARIETIES OF THIS CLASS OF NEOPLASMS.*

By Christian R. Holmes, M.D.,

CINCINNATI, O.

V. S., a woman of ninteen years, was brought to me October 16, 1901, by Dr. A. P. Banfield, of Buchanan, Ky. The patient was brought on account of an enormous post-nasal growth, which had assumed such proportions that it seriously interfered with breathing and swallowing. The doctor had one month previously removed a portion of a large firm mass which protruded externally from the right naris. (At *a*, Fig. 2, is shown what was left after amputation of the mass that projected into the naris).

HISTORY.

Patient is well developed and nourished, and excepting the ordinary diseases of childhood, she has always enjoyed fairly good health. When a small child she had frequent attacks of earache, following upon one of which an acute purulent otitis media developed, which subsequently became chronic, and continued to discharge until three years ago, when it ceased. When the patient was two years of age, her parents noticed that she frequently had difficulty in breathing, nasal respiration was almost impossible, her voice had a nasal twang, and when asleep she frequently had to be shaken or her position shifted to facilitate respiration and to relieve cyanosis; the respiratory disturbances were thought by the family to be due to enlarged tonsils.*

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*Read before the meeting of the Middle Section of the American Laryngological, Rhinological and Otological Society, St. Louis, Feb., 1902. To be published in the Journal of Laryngology.

From this time on embarassed respiration and frequent cough, and of late years difficult deglutition, were the principal signs of some abnormality of the nose and pharynx. In January, 1901, she contracted a severe case of la grippe, and from that time to the present all of these symptons have been much aggravated. At no time had she any severe pain or bleeding from the nose or throat; but swallowing, breathing and the use of the voice became constantly more difficult, until now, unless care is exercised and time given, food will be returned from the pharnyx

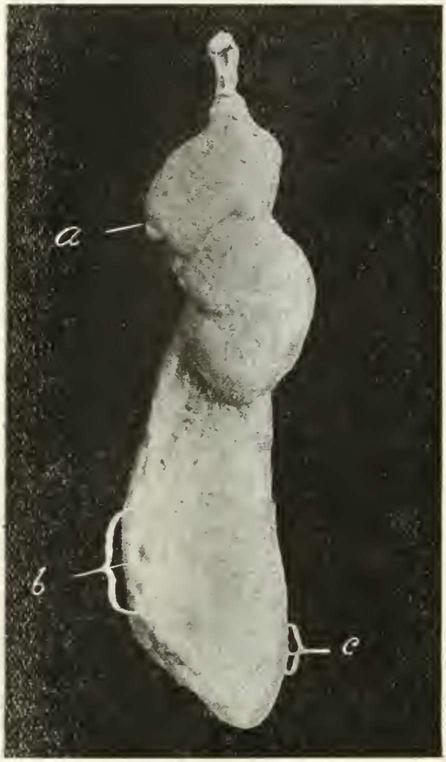

Fig. 1.—Side view.
a, stump of nasal mass removed; *b*, adhesions to base of tongue; *c*, adhesions to posterior wall of pharynx.

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*Just when the growth first extended into the pharynx, patient is unable to state. Coming from an illiterate family of mountainers, such a lesion was no doubt only noticed after it began to seriously inconvenience her.

through the nose and speaking, or even breathing, while lying on the back is well-nigh impossible. Even when in an erect position the breathing is so noisy that it can be heard in an adjoining room; the secretion from the nose and pharynx is very abundant; her voice is low, and of a pecular guttural quality.

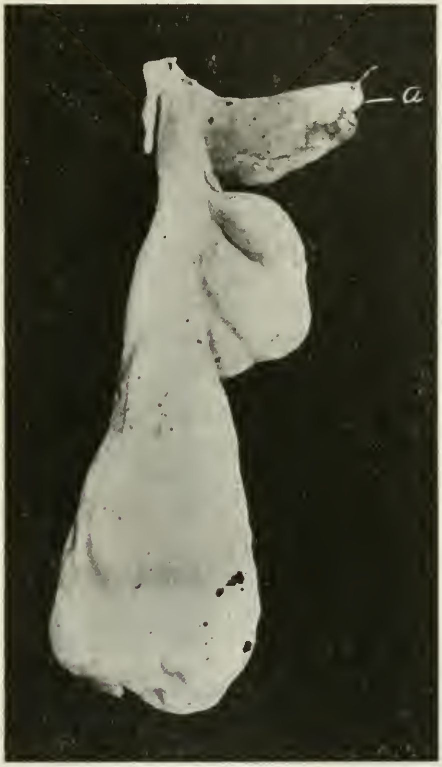


Fig. 2.—Front view.
a, stump of nasal mass removed.

On examination it was found that almost the entire pharyngeal space was filled with the mass of a pendulous tumor, apparently hanging from the right side of the vault. The examination found it of a very soft consistency, with smooth surface, and of a pale, grayish color.

Its horizontal diameter was sufficient to almost entirely fill the pharynx from pillar to pillar, completely obstructing any view of the posterior wall, and pushing the soft palate far forwards, the uvula lying almost horizontal, with its tip pointing to the left. The tumor mass extended downwards, below the base of the tongue, coming in contact with the anterior and superior surface of the epiglottis, preventing the latter from rising more than about 45 degrees from the plane of the entrance to the glottis, as could be made out by the use of a small mirror through the slit-like passage on the left side.

A large blunt hook could readily be passed behind the tumor, but it was found impossible to raise the growth. I first thought this was due to the fact that the mass was club-shaped, and the tumor too firm and thick to bend upon itself; but, under cocain, adhesions were found between the tumor and the base of the tongue, and between the tumor and the posterior wall of the pharynx, about on the level with the epiglottis. These adhesions were very firm, making it necessary to resort to chloroform to complete the examination and perform the operation.

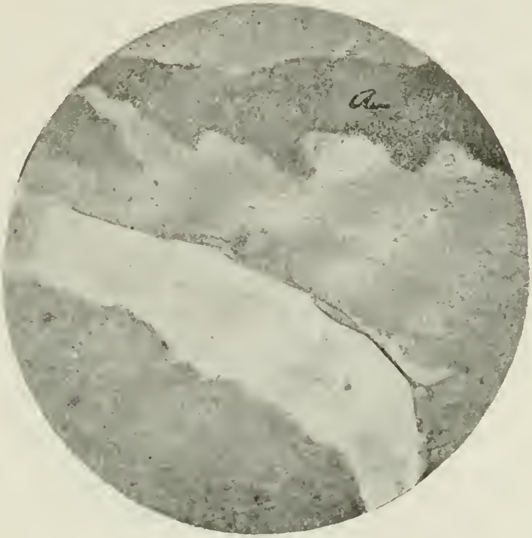
OPERATION.

The anesthetic (chloroform) was given with some difficulty on account of the already embarrassed respiration. The adhesions were separated by a strong blunt hook and the finger, the growth lifted out of the lower pharynx, the base of it thus protruding outside of the mouth, where it was grasped with the fingers of an assistant. A loop of No. 6 piano wire was then slipped over the mass and up to the pedicle, but the latter was composed of such dense fibrous tissue that the loop broke in the first attempt to cut it through. The tumor was then grasped in the hand and twisted upon its long axis until gave way at its point of attachment (a puncture, followed by an incision, having first been made into the mass to determine its vascularity and the probable danger from hemorrhage). The removal of the growth was followed by free hemorrhage, which, however, lasted only a short time.

Rhinoscopic examination the following day revealed the point of attachment to have been above and anterior to the mouth of the Eustachian tube, a little below the posterior end of the middle turbinated. The right naris was very roomy, no doubt due to pressure from the projection which grew into it.

Recovery complete, leaving no trace of the original seat of the growth, and up to date, February, 1902, there has been no sign of recurrence. The specimen was placed in Kaiserling solution and handed to Dr. J. E. Greiwe, Director of the Clinical and Pathological Laboratory of the Cincinnati Hospital, whose report I give below.

Fig. 3.—Section of surface layers.



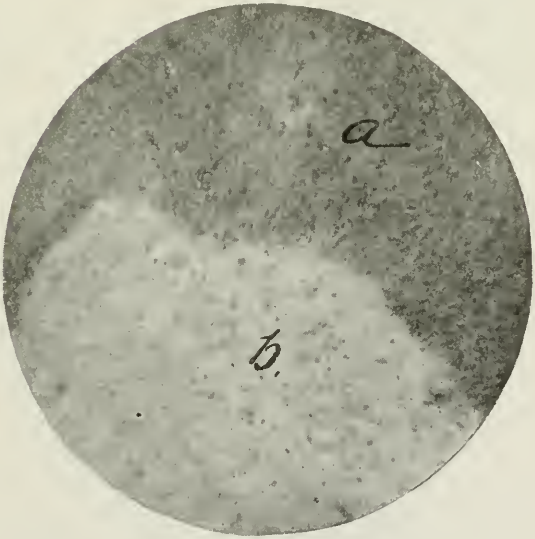


Fig. 4.—Section of superficial and deep layers.

PATHOLOGICAL LABORATORY OF THE
CINCINNATI HOSPITAL.

The large naso-pharyngeal growth which you sent me for examination I find to be a rather firm mass, of irregular outline, having a distinct pedicle, and showing evidence of having undergone constriction in some parts, and showing, furthermore, evidence of pressure in other parts.

The surface is slightly granular (like shagreen) and the whole mass of a yellowish-white color. The surface shows no macroscopic evidence of ulceration, but near the lower extremity the epithelium is abraded over an area of 5 x 20 mm., and on the anterior surface another 5 x 10 mm. (areas of adhesion to posterior wall of pharynx and base of tongue, *b* and *c*, Fig. 1).

Microscopically I find that the tumor is covered by several layers of epithelial cells. (See Figs. 3 and 4). The upper layers of epithelium are more or less flattened and somewhat elongated. The cell body and the nucleus of the upper layers stain very faintly with hematoxylin. Deeper down the epithelial cells are very well preserved and normal in every respect.

Immediately beneath this layer of mucous membrane I find an area occupied by small round cells with single nuclei and cells more or less spindle-shaped, with well-stained nuclei, lying in a delicate meshwork of fine fibres, which also supports numerous delicate capillaries (*b*, Fig. 4).

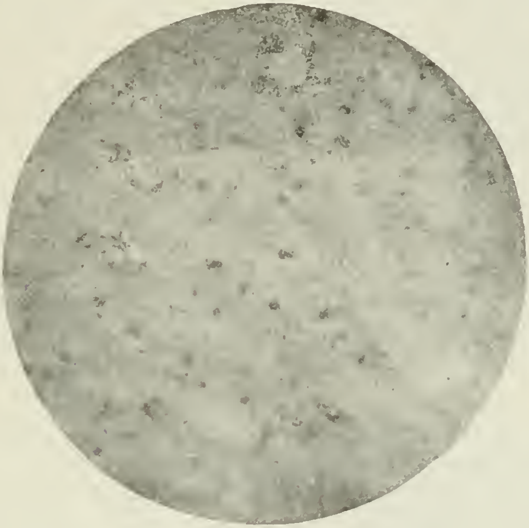
Immediately beneath this submucous layer can be seen denser bands of fibrous tissue, closely packed together (Fig. 5), and in this firm mass of wavy fibrous connective tissue are cells which are for the most part stellate in character, with distinct nuclei and delicate tapering ends, which can often be followed as delicate wavy fibres for a considerable distance from the cell itself.

Close to the submucous layer the fibrous tissue is very closely packed together, but toward the central portion of the tumor the fibrous bands are more or less widely separated (Fig. 6), and each delicate little fibre is clearly separated by a space occupied by a homogeneous mass, which on macroscopic examination appears to be a gelatinous substance. The soft tissue is rather rich in capillaries, whose endothelial lining is well preserved. The capillaries are often surrounded by a number of small cells.

Diagnosis: Soft fibroma arising from the submucous connective tissue.*

J. E. GREIWE, M. D.

Fig. 5.—Section of deep layers.



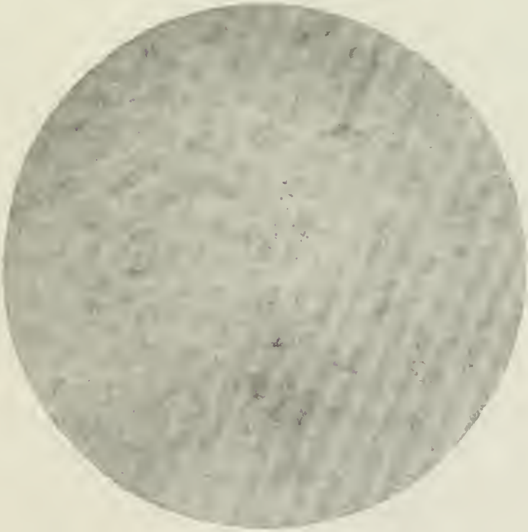


Fig. 6.—Section of deep layers.

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* The fibrous layer covering the roof of the pharynx and pterygoid plates, and extending for a short distance over roof of nose, and lower and posterior surface of the upper turbinated bones.

The name polyp was given by the ancient writers to certain tumors from their similarity to the cuttle-fish (sepia), these growths being found upon various mucous membranes of the body, as the bladder, uterus and intestinal tract, as well as in the nose; the latter place being a common seat of these neoplasms. The word "polypus" has been specially applied to the pedunculated mucous neoplasms of the nose (Schleimpolypen), but the name has also been extended to fibrous growths, including those of the naso-pharynx.

These growths have been mentioned in the earliest writings; the works of Hippocrates contain mention of five cases of tumors of the nose. The name has been retained through the centuries, and late authors—Morrel Mackenzie, Hopmann, Zuckerkandl, and others—have still retained the word as a general name for all non-malignant nasal tumors.

Polypi have their origin in the mucous membrane, springing from the latter by a more or less constricted pedicle, the structure of the mucous membrane being reproduced in various proportions in the new growth.

While as noted an author as Heymann[4] is still in favor of retaining the word polypus, and classifying the growths according to their shape, it seems to me that a classification according to their histologic structure, as advocated by Zarniko, Zuckerkandl, Hopmann and others, is not only scientific, but much more in keeping with our knowledge of to-day. According to this classification we must use the term fibroma, which includes not alone the above-mentioned mucous polypi, but also fibromas as found in the pharynx, etc. These fibromas belong to the class of tumors that spring from the mesoblastic layer (connective-tissue growths), and are classified as follows:

A. Edematous fibroma, as found in the nose, classified according to their microscopic structures into—

1. Fibroma edematodes simplex.
2. Adenofibroma edematodes.
3. Fibroma edematodes cysticum.
4. Fibroma papillare.

B. Fibroma of the naso-pharynx.

The last-named growths are, histologically, entirely distinct from the edematous fibromas (mucous polypi) found in the nose. Mucous polypi are products of the mucous membranes, resulting from increase of, and new formation from, the tissues which go to make up the normal membrane. It is still a mooted question whether these growths are the result of an inflammatory hyperplasia, or are really new growths. There always exist inflammatory changes in the immediate vicinity of the growths, but whether preceding the polypus, and thereby leading to its formation, or only a result secondary to the irritating presence of the growth, is also still to be proven.

The fibroma of the naso-pharyngeal space is a different tumor, and a vastly more serious growth, springing from the periosteum or fibrous layer, and is usually extremely hard. They grow steadily, and having filled the space in which they have their origin, they invade other cavitives, after causing resorption of the bony structures intervening, sending out arms in various directions along the lines of least resistance, thereby producing the characteristic deformity of countenance designated "frog-faced." Hence they were also likened to the polyp or cuttle fish by older writers. At times there results, from pressure and friction due to movements of the growth, ulcerations on its surface and on the surface of the opposing membrane, which generally terminate in circumscribed areas of adhesion. But notwithstanding this intimate connection, there is never infiltration of adjoining tissue. the nourishment of the growth coming entirely from its point of origin through its pedicle or base. This explains why, after cutting off this blood supply, all of the tumor disintegrates, no matter how extensive its adhesions may be. These growths may or may not be very vascular. In the vascular variety there is frequent hemorrhage resulting from rupture of the numerous blood vessels found near the surface of the growth. These hemorrhages may endanger life, either on account of their quantity or frequency.

The typical naso-pharyngeal fibromas are very rare growths, and the extra-pharyngeal still rarer than the intra-pharyngeal (8 to 61 in the statistics of Bensch).[6] They are found much more frequently in the male than the female, and between the ages of ten and twenty-five years rarely before or after this period. Bensch[6], cited by Zarniko[2], has advanced the following theory in order to explain the cause for these periods of immunity:

"1. The congruent or correspondent development of the skull in both sexes during childhood results in the equal frequency of the naso-pharyngeal polypi in either during the early years.

"2. The divergence of the development of the skull bones of the face in the male from that of the female at the time of puberty explains the difference in frequency of this affection in both sexes.

"3. During the developmental period, for unknown reasons, the periosteum may become unable to form bone over a circumscribed area, and the physiologic increase of nutrition incident to the development of the body at this period causes an equal amount of nourishment to be carried to this circumscribed area, which, not being used up in the formation of bone, leads to hypertrophy of the periosteum at this point, and consequent development of the fibroma."

The arrest of the development of the skull after the twenty-fifth year, when this increased nutrition ceases, explains the cessation of development in these growths at this time, or they may gradually disappear spontaneously, as has been observed in a few cases where the growth had either been incompletely removed or not operated upon. This is well illustrated in the following cases quoted by Bosworth:[16]

"CASE I.—A young man, aged twenty-two years, came with an enormous naso-pharyngeal fibroma, impinging upon the base of the tongue, while at the same time sending a prolongation into the nasal cavity. The great dyspnea, and the repeated attacks of severe hemorrhage, had resulted in such impairment of the general health as to render any radical operative procedure hopeless. An attempt was made to modify the growth by electrolysis injections and caustic applications, with but little success, although the patient's life was prolonged for six months, when a rapid extension of the tumor occurred, giving rise to exophthalmos, with symptoms of brain pressure. The case being regarded now as utterly hopeless, all measures of treatment were abandoned, upon which there supervended a process of reabsorption, resulting at the end of two years in the complete disappearance of the tumor, and an entire restoration to health.

"CASE II.—A boy, aged fourteen, suffering with a naso-pharyngeal tumor, completely filling the upper pharynx, and extending to and pressing upon the soft palate, closing both posterior nares. Several operations were attempted without success, and finally Grynfeldt[100] performed partial resection of the superior maxilla. He only succeeded, however, in removing a portion of the tumor, although making several attempts at different times. Operative procedure being abandoned, the boy was dischrged, reappearing, however, seven years later, perfectly restored to health, when an examination revealed a small dense tumor in the pharyngeal vault, about the siz of a pea, at the site of the original neoplasm."

The symptoms of these growths are alterations in the speech, due to nasal obstruction; frequent nasal hemorrhage and resulting anemia; occasionally an unpleasant odor from stagnation of the secretion and resulting ulcerations; displacement of the nasal and facial bones, and one or both eyes, with resulting exophthalmos and disturbance of vision; neuralgia, etc. If not removed the neoplasm may enter the cranial cavity by erosion of its walls, or it may extend downward into the pharynx, interfering with deglutition and respiration, death resulting from choking, inanition or cerebral involvement, unless the second period of immunity (the twenty-fifth year), with resulting arrest of development and retrogressive metamorphosis, arrives before the growth has advanced to this stage.

We must now consider a second and third variety of the naso-pharyngeal fibromas or atypical form of these growths.

(a) Non-typical Hard Fibromata.—These may histologically and anatomically be identical with the typical form, but differ clinically in that their growth is not limited to the period above mentioned. They consist generally of only a pharyngeal and nasal process; spontaneous bleeding and ulceration are the exception, and not the rule. They are of very slow growth. Between this type and the mucous polypi of the nose, Zarniko has described a third variety which Panas has designated as choanamargin-

polypi (myxofibroma, fibro-mucous fibroma, soft fibroma). These spring from the edges of the choana or posterior nares, or the immediate vicinity, or even the posterior ends of the turbinated bodies, generally by a small pedicle. They may attain an enormous development, but bleeding and resorption of adjacent structures from pressure is rare in this variety, while it is the rule in the true fibromata. They also reached to the larynx.

Störk [20] and Zaufal [21] have both reported such cases. Störk's specimen was 9 cm. long, and measured 10.5 cm. in circumference, while Zaufal's was 11 cm. long, 6 cm. broad, 3.5 cm. thick, with a circumference of 14 cm., and sent a prolongation 5 cm. long into the left naris.

Dr. J. Mikulicz[7] states that the soft fibromas of the pharynx are rare, even more so than the more firm fibrous variety, and that they may reach the size of a pigeon or even a chicken egg, but are as a rule much smaller. They generally have a long pedicle, "shaped like the clapper of a bell" (Bouilloud).

Prof. Dr. Moritz Schmidt [9] found the naso-pharyngeal fibroma thirteen times out of 32,997 patients, or once in every 2,438 cases. As a rule, the affection is much more frequently found in the male, although his cases were exceptions. Of the thirteen cases, seven were in the male and six in the female. He describes the fibroma as frequently ulcerating on its surface, perhaps because they are generally poorly supplied with capillaries, and the blood supply is mostly carried by small arteries. As a result the hemorrhage may be very violent; the ulcerated surfaces often lead to adhesions, which complicate the operation for removal, although in the nose, where there is frequently found a finger-like projection, he has never seen adhesions, which would argue that the adhesions are perhaps only due to the friction which such a tumor must be subjected to by the act of swallowing, coughing, etc.

The naso-pharyngeal fibromas that spring from the vault of the pharynx are to be regarded as the most dangerous because of their greater vascularity, and in some cases the origin is to be looked for in deeper structures. Karl Hirschberg[226] regards these as "Reste" (remains) of the cord, and has reported two cases, one growing out from the fossa spheno-palatina, developing outward and involving nearly all of one-half of the skull. The other sprang from the sphenoid bone. He describes them microscopically as being remnants of the cord, in one case having more of the appearance of sarcoma, while in the other that of fibroma or fibro-sarcoma. He regards them as nonmalignant, as they do not infiltrate other issues. They destroy only by usur.

Bensch has aptly put it that they are "clinically and not anatomically malignant." Mikulicz and Michelson[11] describe and figure in their beautiful Atlas one case each of soft fibroma and fibro-sarcoma, "basis-fibrom" springing from the roof the pharynx, each being about the size of a walnut. The soft fibroma occured in a woman twenty years of age, was movable, and sprang from the posterior end of the septum narium. It was removed, and control-examination one year later revealed no trace of recurrence.

The fibro-sarcoma occured in a boy of seventeen. It was the color of normal mucous membranes, a smooth, hard mass attached to the roof by a broad base. In this case electrolytic and galvano-cautery treatment was resorted to thirteen times, at the end of which only a portion of the lower end ot the tumor had been destroyed. Patient did not return for several months, when a radical operation was determined upon, result not given.

Moritz Schmidt state that "the fibroma consists of connective tissue and elastic fibres, with a more or less liberal blood supply. When the growth springs from the naso-pharyngeal space, it often contains round cells in addition to the above, and is designated as fibro-sarcoma, which, however, has none of the malignancy of a sarcoma."

If the growth is of a pale gray color, pedunculated, it is likely to belong to the soft mucous fibromas, and can readily be removed without any danger of serious hemorrhage. But if the color is that of the surrounding mucous membranes, or a pale pink or rose color, and the growth very firm to the touch, and not readily movable, if at all, forming one large, rounded, smooth mass, with or without a projecting mass entending into the naris, with a frequent history of hemorrhage, then there can be little doubt that we are dealing with a hard true fibroma. It is, however, not always easy to differentiate this growth from a sarcoma. The latter is, as a rule, of a pinkish-yellow color, generally presenting an irregular, rounded or lobulated aspect, and of a soft, pultaceous consistency upon palpation. But the only safe way to differentiate is by removal of a small piece for miscroscopic examination.

TREATMENT.

Removal is the only treatment that can be considered, but authors differ somewhat as to the manner of procedure, as the following extracts will prove. Operative treatment upon nose and pharynx has made marked progress with the advent of cocain, and the rhinologist has attained a profiency for operating within the narrow confines of the nose and throat never acquired by the general surgeon, as is proven by the following translations from the recent text-book of so high an authority as Dr. Franz König,[18] Professor of Surgery and Director of the Surgical University Clinic at the Charitè in Berlin. In his text-book on special surgery, under the heading of the treatment of pedunculated growths of the naso-pharynx, page 320, he says: "Soft mucous polypi located in the upper portion of the nose can only be thoroughly removed by splitting the nose in the middle or through a temporary resection of the middle after the well-known method of Langenbeck or Bruns," and he then proceeds to describe the method of their removal by a very sharp spoon, the polypi being guided into the spoon by the index finger of the surgeon, which has been passed through the mouth of the patient and up behind the soft palate(!). Such heroic measures being resorted to for simple polpi, we, of course, expect that for the naso-pharyngeal fibromas he would advise the most serious methods of operation. To show the seriousness of the operation he quotes Dieffenbach, who wrote "that great courage is required to undertake this operation, because the surgeon is almost compelled to choose between one of three conditions—choking to death of the patient during the operation, bleeding to death at the time of the operation as a result of tearing or cutting them out, or not finishing the oporation."

These serious conditions result from the difficulty of reaching the seat of the growth.

While König[18] also speaks of the cold snare and cautery loop as efficient for operations upon these growths, yet the very fact that in a recent text-book such measures as the splitting of the nose or temporary resection of the upper maxilla for the removal of the ordinary mucous polypi should even be mentioned, proves that intra-nasal and pharyngeal non-malignant growths should be operated upon by the rhinologist instead of the general surgeon, because of the greater dexterity which the former acquires by daily practice within the narrow confines of this area.

The treatment of the fibromata and fibro-sarcomata by electrolysis was first suggested by Nélaton[50] in 1864.

The number of treatments by electrolysis that some of the reported cases have been subjected to is very large. Thus Prof. Van Bruns[69] reports a growth cured in a young man after 130 sittings, at intervals of two or three days. Michel[155] reports cure in four cases, each of which required fifty-three, forty-seven, ninety and forty-seven sittings respectively. Moritz Schmidt[9] favors the treatment by electrolysis, using a current of from 30 to 40 M. A., each sitting of from ten to twenty minutes' duration, and states that from ten to twenty or even one hundred sittings may be required in special cases, the rapidity of treatment depending largely upon how the blood supply can be cut off by destruction of the large nutrient vessels in the pedicle. The galvano-cautery was one of the early means resorted to for the cure of these growths, and Prof. Middeldorpf[31] was the first to propose and execute this method in 1854.

The careless use of forceps and too forcible grasping, pulling, twisting and tearing these growths is not without danger, as shown by Forster,[64] in a case cited by Cohen[17]:

"The patient was ninteen years of age and had a large growth filling the left nostril, firm, fleshy and fibrous, and covered with mucous membrane. The right nostril was not much interfered with; there was no swelling of the face or fulness of the palate, nor any projection into the throat. Chloroform was given, and a wire snare was put around the growth, which broke off and caused it to bleed profusely. Forster then made another examination, and having passed his finger up the nostril, found an enormous growth which could not be circumscribed, but large portions of which he tore away with forceps. Four days after the operation the patient suddenly became unconscious.

The right half of his face was numb, and though he rallied, he was never able to speak—except to say "too-too." The temperature rose to 102° F. He had three convulsions on the seventh day and became totally unconscious, and died twelve days after the operation. The post-mortem examination showed general arachnitis and sloughing of the brain above Broca's convolution. That portion of the growth which had not been removed occupied the left side of the external base of the skull, and filled the base between the greater and lesser wings of the sphenoid, the orbital plate of the frontal, and the cribriform plate of the ethmoid bone was broken, and at the back there was a small opening about a quarter of an inch in diameter, and a fracture extending forward from the opening. Microscopic examination showed the growth to consist of small fusiform cells and stellate connective tissue."

In addition to electrolysis and the galvano-cautery, the cold snare and galvano-cautery ecraseur are most valuable instruments at our disposal in the removal of these tumors.

Where the patient is not seen until his vitality has been weakened by frequent hemorrhages, the rapid radical operation must be resorted to by the natural avenues, if possible; but if not, then by splitting the soft palate according to Levret, or, in extreme cases, temporary resection of the superior maxilla after von Langenbeck, or Rouge, Chassaignac, Ollier, or one of the numerous operations devised to reach the naso-pharyngeal space, for detailed descriptions of which see works on general surgery.

A typical case of naso-pharyngeal fibroma, which died under the anesthetic, has been reported by Dr. Thomas M. Stewart[22]. An abstract of his report of the case is given below, with a picture of the patient showing the typical frog-face (see Fig. 7).*

"*History.*—Five months previously the left eye was noticed to be protruding from its socket. No medical attention was given the child until after the condition had lasted six months. There had been no pain at any time.

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*I am indebted to Dr. Stewart for the negative. Unfortunately, the tumor and microscopic slides were destroyed by fire in his laboratory.

Post-nasal hemorrhages had also been noticed at about the time exophthalmos was first noted.

Nasal respiration was good before the eye protruded, but it was less free progressively after the protrusion of the eye. The patient was one of four children (all girls); one sister died in infancy. The mother is a large woman, and has had considerable trouble with frequent enlargement of the cervical lymphatic glands. Father is a large, strong man, and his personal history was good. There had been frequent hemorrhages from the nose.

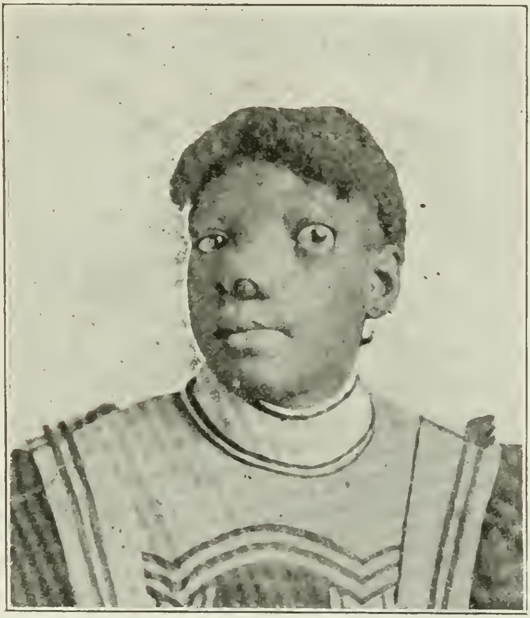

Fig. 7.—Showing the "frog-face" deformity.

Examination.—Left eye protruded straight forward; restricted excursions in all directions; fundus examination showed a white nerve, small arteries, and large tortuous veins.

The left orbit felt free to the finger except at the inner side, where a hard protuberance was detected; the protuberance extended back as far as the finger could reach. Needle passed into it, excluding a bony growth.

The left nostril was filled by a large, smooth, pinkish growth, from front to back, pushing the septum into and occluding the right nostril.

The growth bled easily; cocain had no reducing effect upon it; no attachments to septum were found. Pieces of the growth removed for microscopic examination, pronounced fibroma.

Operation.—The parents reluctantly consented to an operation only after seeing the horrible frog-face develop. On December 15, 1898, the patient was brought to the operating-table in the Ohio Hospital for Women and Children, having been in the hospital some twenty-four hours previously.

The left nasal cavity was opened by the Burns operation, and the tumor removed by the wire ecraseur. Hemorrhage was controlled very largely by actual cautery. As the operation was about completed the patient gasped and never returned to consciousness, though strychnin hypodermically, artificial respiration, sphincter dilatation and the electric current were tried in vain.

Post-mortem.—In addition to the mass completely filling the left nasal cavity, pushing the septum into and occluding the right nostril, and pushing the nasal bones out, thus giving the frog-face appearance, we found the cribriform plate of the ethmoid raised up and as thin as tissue paper, so that a portion of the growth one-half inch in diameter projected in a rounded mass into the cranial cavity. There was no evidence of cerebral inflammation. The orbit was also filled by a pushing out of the os planum of the ethmoid. The growth appeared to spring from the upper margin of the left posterior naris, also filling the upper portion of the naso-pharyngeal space on the left side, but did not extend downward so as to encroach npon the left soft palate."

While death from chloroform may occur under any condition, yet it is well enough to bear in mind when operating upon this class of cases, that on account of the frequent and often excessive loss of blood, the resulting anemia may lead to defective nutritive supply to the muscle-cells of the heart, by impairment of the oxygen-carrying power of the blood.

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ABSTRACTS FROM CURRENT OTOLOGIC, RHINOLOGIC AND LARYNGOLOGIC LITERATURE.

I.—EAR.

Successful Operation upon a Case of Brain Abscess Following Suppurative Middle Ear Disease.

FREDERICK L. JACK, Boston. (*Boston Medical and Surgical Journal*, Dec. 26, 1901.) The case was that of a man 25 years of age, whose left ear had troubled him for three years. Discharge had then ceased up to six months previous, when it reappeared. He was admitted to the hospital for frontal headache and pain in the ear. Mastoid was tender but not swollen. There was a small amount of pus in the auditory canal. The hearing for the voice was reduced about one-half. The headache became more severe, but the mastoid tenderness gradually disappeared. Temperature fell from 101 to 99. A paracentesis had been done on entrance to the hospital, but seven days later the patient had a chill, complained of intense frontal headache, and the temperature rose to 102. There was no tenderness over the mastoid.

Operation was done and the bone found much sclerosed as far as the antrum, which was filled with pus. Granulations and purulent matter were found above and posteriorly. The bone was removed from the middle fossa for a distance of over one inch in length and a half-inch in breadth and the lateral sinus exposed for about an inch. The dura was normal in color, without bulging, and the wall of the sinus showed nothing abnormal. The incus and masses of cholesteatoma were removed.

Patient did well for a few days, but on the eighth night after the operation he was found pulling and pushing the bedclothes, and could not be roused. Temperature was 93; pulse 102, thin and wiry. Convulsions soon appeared in hands and arms. Temperature rose to 103, and the pulse fell to about 60. Patient became quiet and deeply comatose. This condition continued for several hours, when the wound was reopened and enlarged by an incision upward over the squamous bone and posteriorly for about two inches toward the occipital protuberance. The bone was removed so that a larger surface of the middle cranial fossa was exposed than at the previous operation. There was no opening in the dura, but it bulged outward over the tegmen. A hypodermic needle was passed twice upward into the brain, pus being withdrawn the second time. A narrow incision was then made over the tegmen, passing about one inch into the brain in the direction taken by the needle, and this opening enlarged by forceps, and over four ounces of foul pus and sloughing brain tissue evacuated. The abscess cavity was irrigated, then wicked with a small piece of iodoform gauze, and the wound over the skull partly closed by sutures. The temperature rapidly fell. The wound was dressed daily, and two days after the operation the patient recognized his attendants. During the next four days there was considerable headache, and at times he was roused with difficulty. The discharge of pus became less, while the brain itself bulged somewhat into the mastoid wound.

Aphasia next developed, and the patient was unable to name an object when shown him, but repeated the name when told him. Symptoms of imperfect drainage appearing, the abscess cavity was enlarged with blunt scissors and about two ounces more of very foul pus evacuated, after which recovery was uninterrupted.

In reviewing the case the author asks the question: "Should the brain have been explored for the abscess at the time of operation upon the mastoid?" and, in the absence of symptoms pointing toward the brain, answers the question in the negative, although he says that the abscess undoubtedly existed at the time of the first operation and was the cause of the headache. He does not think that the usual practice of trephining or opening by the chisel over the ear is invariably necessary, as he had no trouble in draining through the tegmen tympani, and thereby avoided the danger of hernia. If the opening through the tegmen should not afford sufficient room, the external opening is to be made.

A study of the aphasia persisting during the convalescence of this case, by Dr. George L. Walton, of Boston, accompanies this article. *Richards.*

A Case of Otitic Brain Abscess; and the Lessons Which It Obviously Teaches.

ROBERT LEWIS, JR., New York. (*Medical Record*, March, 1902.) The patient was a young woman 23 years of age, with an old foul purulent discharge from the left ear since childhood. For ten days previous to being seen by the author she had chills, vomiting, fever and delirium, followed by facial paralysis, drowsiness and amnesic aphasia. On admission to the hospital the temperature was 103 $^1/_2$; pulse 108. There was abundant foul discharge from the external canal, and tenderness over the antrum and tip.

A radical operation was done, and the antrum found to be filled with foul-smelling discharge, partly cholesteatomatous. There was necrosis involving the wall of the sigmoid sinus, which was exposed for a distance of one inch, and found coverd with foul-smelling pus and granulation. From the tegmen tympani there was a fistulous opening leading into the cranial cavity. On the removal of the tegmen a tablespoonful of foul-smelling pus flowed out. The greater portion of the squamous portion of the temporal bone was removed. The exposed dura was blackish in spots and bathed in pus, and was walled off by adhesive inflammation from the healthy dura. An incision was made into the brain to a depth af about three-quarters of an inch in an upward and forward direction, and at the point where the dura showed the greatest tension. An abscess cavity about the size of a large walnut, lined with a distinct membrane and containing disintegrated brain material and pus, was thereby opened. Syringing was not resorted to; the cavity was wiped out with pledgets of gauze, and sterile gauze packing was used, sutures being employed for closing the upper portion of the wound.

During convalescence the temperature did not rise above 100, and the after-treatment was uneventful, with the exception that after the disappearance of the aphasia and some six weeks after the operation a small abscess developed in the anterior extremity of the wound. This was opened under ether. Twelve weeks after the operation epidermization of the tympanic cavity had taken place, and the external wound had entirely healed.

This case is of special interest as showing the dangers of a chronic discharge from the ear which may at any time cause severe symptoms. *Richards.*

A Conservative Element in Acute Mastoid Surgery.

EDWIN W. PYLE, Jersy City (*The Medical News*, Jany. 18, 1902), gives his deductions drawn from a case of mastoiditis which recovered without operation. Although the symptoms were grave, nevertheless operation was refused, and after a while complete recovery followed a course of douching and massage, which later dislodged the pus from beneath the fascia into the external canal. The recovery, so the author states, was "more perfect than could have been wrought by surgery."

(The few cases of this kind which are occasionally reported do not offset the number that fail to get well; nor should the fact that acute otitis media in the majority of cases usally gets well, blind us to the potential dangers of an acute mastoiditis, even though, as the author states, general practitioners of large experience may have seen but few such cases—Reviewer). *Richards.*

Some Aural Complications of Influenza.

S. MACCUEN SMITH, Phildelphia. (*Philadelphia Medical Journal*, Jan. 11, 1902.) Acute middle ear inflammation and acute mastoiditis are considered, the latter only with reference to early diagnosis. The treatment of acute middle ear inflammation coming on in connection with influenza should consist of absolute rest in bed, with free diuresis and properly conducted diaphoresis. Hot antiseptic solutions syringed into the external canal are useful, but medicated drops are of no value. Should the syringing fail, to relieve promptly, free incision of the tympanic membrane, followed by antiseptic irrigation and gauze drainage, should be performed. *Richards.*

Modern Mastoid Trephining Operations, With Notes on 100 Recent Operations.

ALEXANDER RANDALL, Philadelphia. (*American Journal of the Medical Sciences*, April. 1902.) While the author regards the danger of operation as being not much more than that of etherization it self, he nevertheless says that we should as yet be cautious in urging operation for mere suppuration without disquieting symptoms, and only after full effort has been made to improve the general and local health, should we decide that tympanic exenteration is needful. He regards the thorn-like suprameatal spine as the most reliable landmark, close behind which is the typical point for opening the bone, and reminds us that "The floor of the cerebral fossa may be no higher than the spina, but can hardly be lower; the knee of the sigmoid sinus may come thus far forward, instead of lying on the average ten milimeters back and up; the antrum may be but a millimeter within the cortex in an infant, or an inch away in the adult with a large mastoid; yet in general we can safely chisel onward, forward and upward from a point close behind the spina, and at a depth of some fifteen to twenty millimeters should enter the autrum. Remembering that this cavity lies up and back from the canal, separated from it only by a wedge-shaped partition of bone, we have a constant guide to it furnished by a probe in the canal, the roof of which is about level with the floor of the antrum.

"As there is no means of foretelling the relation of the lateral sinus to the operative field, it is essential to safe work that we employ, instead of any blindly-entering boring device, the chisel or spoon, which enable us to remove scale by scale of the bone without risk to the underlying structures."

For radical operation he prefers the method of Stacke to that of Kuester or the Schwartze–Stacke operation. In making the flap the suggestion is given that the cartilaginous portion should be exsected in forming it. since the cartilage of the canal is useless for grafts, melting down itself, often involving in its necrosis the better tissues.

Three to seven days in bed, with infrequent dressings dependent upon pain, fever, discharge and odor, and as much longer detention in the house, usually suffices.

Facial paralysis, he thinks, should occur but rarely in careful hands, unless caries already surrounds the nerve. Even then recovery usually takes place in from six to twelve weeks.

The removal of the drumhead and ossicles has proved of little value for the inprovement of hearing, but simply conserves what has been left by the suppuration.

Of the 100 cases, 49 were simply antrum operations for acute lesions; 30 were radical tympanic mastoid exenterations; 12 were done after the Stacke method of tympanic exenteration for chronic suppuration without mastoid caries. There were 11 deaths in the 100; three were children who died of pneumonia and other unrelated conditions; two had fatal meningitis present before operation which was unrelieved by the removal of the primary focus of infection in the temporal bone; two succumbed to pyemia from lateral sinus thrombosis; one to brain abscess which had been found and drained: and one to recurrent cerebral apoplexy. Early operation can do much to prevent the occurence of these fatal complications. *Richards.*

Some Cases of Otitic Pyemia Cured without Operation.

WALTHER SCHULTZE. (*Arch. für Ohrenheil.*, Bd. 53.) The first case was one of true sinus thrombosis, for which only a Schwartze was performed since there was diffuse caries of the labyrinth wall which either way gave a bad prognosis. In the second case an otitis media was followed by septicopyemia with septic endocarditis, septic infection of the skin and metastases in the joints. Prognosis fatal and for this reason no operation was performed. In spite of this, complete cure resulted from medical treatment. In the third case, the sinus was probably opened and the facial wounded by a fracture of the base. For some time blood and cerebro-spinal fluid passed out of the drum perforation then became purulent and the symptoms of pyemia manifested themselves in the shape of high fever and pleural empyema. This was opened. It was decided not to open the mastoid on account of the uncertainty of the diagnostic relations and the severity of the disease condition. Patient was unconscious for a week. Complete cure resulted. *Levy.*

The Operative Treatment of Otogenous Sinus Thrombosis.

GRUNERT. (*Archiv. für Ohrenheil.*, Bd. 53.) Under the usual method of operating in pyemia originating from the ear, the sinus and jugular must eventually be attacked. Until now the bulbus has been considered inaccessible. The writer had three cases in which opening the sigmoid sinus and the jugularis was not sufficient, and to prevent recurring chills he opened the bulbus jugularis uniting the upper and lower portion of the jugular foramen, leaving shallow grooves. In these cases the procedure was successful as without it the patients would in all likelyhood have been lost. *Levy.*

The Relation of the Fundus ot fhe Eye to Otitic Intracranial Diseases.

HANSEN (*Arch. für Ohrenheil.*, Bd. 53), has studied the last 100 cases of intracranial affections occurring in Schwartze's Clinic with the view of determining the occurrence and changes in the fundus of the eye, from a statistical standpoint, with the following results. Changes in the fundus of the eye occur in all otitic intracranial complications, least commonly, 18 per cent, in extradural abscess and most commonly, 87.5 per cent., in hyperemia of the meninges, edema of the brain and meningitis serosa. Otitic suppurative meningitis causes changes in the papilla in 50 per cent. of the cases, abscess of the brain in 42 per cent., greater in cerebral than in cerebellar abscess. They are found in 45 per cent. of the cases ef sinus thrembosis. As to the particular form of change in the fundus found, the commonest was neuritis optica; in only 3 cases was choked disc found. The milder changes in the fundus have just as much importance in diagnosis as the more severe forms. However since changes are found in only half the cases, the positive finding alone is decisive.

Levy.

Endocranial Complications of Acute and Chronic Middle Ear Suppuration.

SCHENKE (*Arch. für Ohrenheil.*, Bd. 53), assistant of Leutert, reports 13 cases observed and treated by him and Leutert and presents deductions which may be considered as the views of Leutert. They do not differ in any important way from those expressed by him in a previous paper. At any rate, the cases support his position throughout their course. Of the 13 cases, 9 were sinus thrombosis, 6 following acute and 3 chronic otisis media, 5 on the left side and 4 on the right. Osteophlebitic pyemia was not present in any case, and local symptoms in the mastoid were present in only one case. The writer concludes that high fever after the cessation of the acute symptoms calls for opening of the mastoid and of the sinus. Finding little in the cells does not indicate the absence of sinus affection. Even the normal appearance of the mucosa of the mastoid indicates as little against the presence of sinus disease as the normal appearance of the sinus wall itself. In opposition to the recent view that an expectant plan should be followed in pyemia, opening of the sinus must be advised in all cases. Death from air embolus has never authentically occurred and artificial sinus thrombosis, just as infrequently. It is best avoided by preventing pus retention and using thorough asepsis. Leutert, as is known, ligates the jugular before opening the sinus. Lumbar pucture is an excellent aid in establishing the diagnosis. Of course an encapsulated meningitis may show nothing but a positive result is certain in its indications. *Levy.*

Adhesion of the Drum Membrane to the Head of the Stapes After Operative Treatment of Otitis Media Suppurativa.

MATTE *(Archiv. für Ohrenheil.*, Bd. 53), in several cases in which the drum membrane was retained or reformed after the radical operation, found that remarkably good hearing followed when it was adherent to the stapes. The writer therefore recommends in favorable cases where the hammer must be sacrified that the drum membrane should be retained as far as possible and that efforts should be made to cause its adhesion to the stapes during the after treatment. *Levy.*

Treatment of Acquired Atresia of the Auditory Canal.

SCHWIDOP. *(Archiv. für Ohrenheil.*, Bd. 53.) Atresias of the auditory canal are difficult to relieve on account of the tendency to a return of the stenosis. The writer operated in a case in which a solid cutaneous closure of the auditory canal extending 5 mm. without involvement of the drum membrane, followed tearing off the auricle. A horizontal cut was made through the canal and a cross cut through the scar, laying it free, then a flap was made from the posterior wall of the canal. In order to obviate a second stenosis, the canal was widened by chiselling off the posterior bony wall at the canal and the flap properly sutured. Healing rapid. As soon as the tampon was left out for a few hours, tendency to a narrowing was to be observed. On this account the writer had a dentist take an impression with plaster and make a rubber prosthetic device. An opening being made, the patient could wear it for a long time without discomfort. *Levy.*

The Pathology of Deaf-Mutism.

I. HABERMAN. *(Archiv. für Ohrnheil.*, Bd. 53,) Deaf-mutism results in the majority of cases from affections of the labyrinth. Even if disease of the middle ear is afterward found, it is not known that it alone may cause deaf mutism. The writer reports a case in which bony adhesions of the round window and fixation of the stapes alone were the cause of the deaf-mutism. The labyrinth was intact. Another case showed quite another picture. Although the round window was the subject of bony occlusion the oval window was free, and the patient could hear ordinary whisper one meter. *Levy.*

Ear Diseases and Hysteria.

Voss (*Zeitschrift für Ohrenheil.*, Bd. 40) illustrates by numerous examples the manifold varieties of hysteria affecting the ear.

In several cases, the patients had placed foreign bodies in the ear in order to simulate an ear affection. The temperature record was often falsified. The author is skeptical with reference to the spontaneous hemorrhage of hysterics. In his cases he was able to discover intentional wounding. Hyperesthesia of the canal and of the auricle was often found and, on the other hand, an anesthetic region which reached to the breast and there was often pain localized in the mastoid. In some of the cases observed by the writer operation upon the mastoid had been performed by him or other surgeons through an error of diagnosis. In a case presenting the typical objective picture of acute otitis media, blood alone was evacuated by paracentesis, from which the writer is inclined to believe that a hysteric otitis media may exist.

The diagnosis of hysteria must be in the first place supported by heredity. Disturbances of sensation of the skin are important, though they are not usually limited to the mastoid, but often to pressure points corresponding to the origin of the occipital nerves.

The anesthesia varies in time and place. The tuning fork is generally not heard through bone conduction on the affected ear. The patients are generally women between 20 and 30 years of age. Respecting the therapy, the writer lays stress and emphasis upon the fact that each attack may disappear. Special attention directed to the ear is harmful inasmuch as the symptoms increase.

For this reason treatment of hysteria of the ear should be conducted by the neurologist and not by the otologist. *Levy.*

The Microscope as an aid to Diagnosis and the Prognosis in Chronic Suppurations of the Middle Ear.

SNYDACKER, CHICAGO. (*Archives of Oology*, Vol. xxx., No. 6.) The author makes a routine practice of microscopically examining the sediment of washing in case of middle ear discharge lasting upward of one year. While unwilling to agree with Bezold, who says "the smallest shreds of epidermis, if it can be shown that they come from the middle ear spaces, suffice to make a diagnosis of cholesteatoma," yet when epidemis is present in these washings and when it persists for weeks or even months then it is safe to regard this as a danger sign.

Another microscopic finding of the greatest importance, is the continuous presence of bone dust in the sediment. If the carious bone has its source in the ossicles and the tympanic wall and mastoid cells are intact, then there can be no danger in delay. Grunert in 108 cases of caries of the middle ear found only two where the ossicles alone were involved while either the tympanic walls or mastoid cells were involved in all the other cases.

The finding of cholesterin crystals is of no great import.

In a series of 13 cases the author found three where after prolonged treatment the microscopic findings were such that operation was advised but in each case declined.

The examination was made by taking portions of washing containing the most sediment and centifuged. One drop was placed on a slide and examined without staining; cholesterin crystals and epithelium could easily be identified; to another portion of the sediment a drop of picrocarmine was added, then spread out and examined.

For detecting particles of bone dust some dried sediment was fixed on a slide with albumin fixative stained with hematoxylin and eosin, dehydrated with alcohol, cleared with carboxylol and mounted in canada balsam.

Campbell.

A Tumor of the Middle Ear Springing from the Inner and Posterior Tympanic Wall Simulating Exostosis but Consisting of Calcareous Laminae.

BRAISLIN, Brooklyn. (*Archives of Otology*, Vol. xxx., No. 6.) The patient had a discharge from both ears for twenty-three years, dating from an attack of scarlet fever. Recently an intermittent, beating tinnitus and a more abundant and serious discharge has come from the left ear.

The right Mt. has a perforation involving its anterior half and lower portion. Thick inspissated pus covers the floor of the canal.

The left Mt. is gone, and the cavity of the middle ear is almost entirly occupied by a smooth, glistening, pinkish-white excrescence, springing from a base, entirely within the annulus tympanicus. The entire growth appeared to be covered with living membrane and to its attachment covered the posterior two-thirds of the inner wall and almost the entire posterior wall of the tympanum.

On operation the mass was found to be a thin cover shell of bone-like consistency, with a transverse diameter of about one-fourth of an inch. The ossicles were ankylosed en masse.

On examination the specimen appeared to be a calcareous degeneration of some previously existing growth possibly a fibroma. *Campbell.*

A Case of Meningitis from Extension of Acute Purulent Otitis Media through Osteomyelitis of the Petrous Bone. Operation. Autopsy. Microscopic Examination.

Knapp, New York. (*Archives of Otology*, Vol. xxx., No. 6.) A woman aged 31, ill six days with pain in the left ear followed by profuse otorrhea for two days. The mastoid red and very tender. Temperature 100° F., pulse 120, no sagging of the superior wall. Ice was applied to the mastoid for 36 hours; pain was relieved but returned on removal of the ice.

On operation, some granulations were found in few of the posterior mastoid cells; next day, a slight chill, temperature 102° F., discharge from ear canal continued. One week later another chill, temperature 104° F., pulse 120. The otorrhea still persisted and at intervals of from one week to ten days chills with high fever kept recurring. Six weeks from the time of the operation there developed slight stupor, severe pain in the head and back of neck. Right pupil dilated, ptosis, optic discs hazy. At a second operation with the exception of granulations and pus in the middle ear nothing was found. The patient became progressively worse and died. On autopsy pus was encountered about the petuitary gland extending backward down to the clivus. A tenacious purulent membrane was found attached to the dura just back of the sigmoid sinus and another over that portion of the posterior surface of the petrous bone, lying between the sinus and the internal auditory meatus. This corresponded to the size of the ductus endolymphaticus, the end of the aqueduct of the vastibule. In the spinal canal there was a great quanity of purulent fluid. Cover glass specimens of the fluid revealed streptococci in long chains.

On microscipic examination the inner wall of the tympanum was found to be the seat of intense inflammation. The niche of the oval window was filled with inflammatory products; there seemed to be a minute perforation through the window. The stapes was gone. There was slight involvement of the vestibule, especially of the perilymphatic spaces, extending to the beginning of the eighth nerve and also partly along the external semicircular canal. Below the round window a fistulous tract measuring 2 mm. in breadth extended in the cancellous bone below the labyrinth from the inner tympanic wall. This cancellous bone was the seat of an intense osteomyelitis. Resorption of the bone had taken place and an abscess had formed in the bony tissue which at the point on the posterior surface of the petrous, where the microscopic lesion was found at autopsy, had distinctly broken though the cortex and invaded the dura. *Campbell.*

Chronic Progressive Deafness.

COLLIER. *(Med. Press. Lon.* Feb. 5, 1902) A policlinic article on nasal obstruction. *Wyatt Wingrave.*

Chronic Median Otitis followed by Suppurative Bursitis.

BRANSON *(Brit. Med. Journ.* Feb. 8, 1902,*)* Case of a male, aet. 27, the subject of discharge for 20 years, who had appendicitis followed by acute suppuration of the subscapular bursal sac and shoulder joint, which was opened, dranied and cured. The author considered it to be staplylocial inspection secondary to ear trable.

Wyatt Wingrave.

On the Treatment of Deafness of Middle Ear Origin.

WATSON *(Brit. Med. Jour.* Mar. 12, 1902) describes a method of treatment by means of external solutions of bone marrow. (The details are somewhat unconvincing, owing to the absence of the orthodox tests and it is difficult to understand what particular forms of middle ear disease are referred to. Abstractor.)

Wyatt Wingrave.

The Question of Ligaturing the Jugular Vein in Sigmold Sinus Thrombasis.

FIRTH. (*Bristol Medico. Chirurg. Jour.*, March, 1901.) The author considers that the records of the operators indicate that ligature of the jugular vein in sinus thrombasis need not be regarded as an essential in all cases; that it is better not to ligate in cases operated upon, before embolic abscesses have formed if a free flow of blood can be estalished from both ends of sinus by removal of thrombosis, or if these be firm, healthy thrombus, by plugging the sinus at the lower end on both sides.

Wyatt Wingrave.

Somnolence Causea by an Ear Lesicn.

W. G. B. HARLAMD, Philadelphia. (*The Philadelphia Medical Journal*, March 29, 1902.) The case is that of a boy of 13, complaining of a tendency to sleep all the time. He would go to sleep without feeling tired or whenever his attention was not aroused by action. He would fall asleep on his way to the store, at the dinner table, and one day slept the entire 24 hours.

This condition had lasted one month. Physical examination showed no defect except a small impaction of cerumen in the left ear. This was removed, and a few drops of fetid pus found behind it. The drum was macerated, and there was a large perforation in the lower posterior quadrant. All symptoms immediately disappeared.

The author considers that the trouble was due to meningeal irritation from the absorption of pus or possibly to pressure upon the labyrinthin fluid. *Richards.*

Operation for Caries of the Mastoid, Secondary Opening of the Lateral Sinus, and Ligation of the Internal Jugular Vein.

JULIUS ROSENSTERN, San Francisco, Cal. (*Medical Record*, Nov. 23, 1901.) Patient was a boy 15 years old who had first noticed pain in the right ear four weeks before, followed two weeks later by severe headache, feverishness, and a purulent swelling over the mastoid.

The usual mastoid operation was performed, the special incident being that there was profuse venous hemorrhage on opening the bone. Five days afterward there was severe pain in the right side of the head, and severe hemorrhage when the wound was dressed, requiring a gauze tampon. Four days later there was pain in the forehead, and three days later the temperature rose to 105.4, and evidences of pyemia were such that the wound was reopened. It looked perfectly clean. The bone over the sinus was chiselled off, and the sinus exposed, but it showed no lesion. It was aspirated, only one or two drops of blood being obtained. The wall of the sinus was opened without hemorrhage occurring. A small curette was introduced anteriorally, but nothing was brought out. Posteriorally, a clot 3 cc. long was removed followed by profuse hemorrhage. The bleeding was allowed to go on for a few seconds, when the wound was packed with gauze. The following day the temperature was 98, the headache and nausea had disappeared, but there was pain in the right anterior part of the neck, and edematous swelling along the line of the internal jugular vein, and pain on pressure. The vein was then ligated through an incision 6 cc. long, internally and parallel to the border of the sternomastoid muscle. It was found to be empty. Ligatures were applied one and one-half cc. apart, and a small piece of the vein excised between them. The wound was immediately closed with a running suture of silkworm gut. Recovery from this time forth was uneventful. Two years have since elapsed, and the patient has remained perfectly well. *Richards.*

Use of Antistreptococcus Serum in a Case of Septicemia Following Mastoid Operation; Recovery.

MARY F. HOBART, Boston. (*Boston Medical and Surgical Journal*, Dec. 12, 1901.) Case was one of severe septicemia in a woman of 63 years, following operation for acute mastoiditis. At the operation all of the mastoid cells were filled with granulations and pus, which pus was found on bacteriologic examination to be loaded with streptococci. After the operation, delirium, high temperature, rapid pulse and tremor were present to such a degree that the case was considered almost hopeless. At the suggestion of the consultant, antistreptococcus serum was used, temperature being at the time 105.2, and pulse 122. 3

cc. were injected under the scapula at 5 p. m., and at 7 p. m. 10 cc. were injected. The pulse increased from 150 to 180, but five hours after the second injection there was a change in the pulse, it became regular, the character improved and it fell to 120. The following morning the temperature was 103, and the pulse 112, and erysipelas developed in the wound. At one p. m. of the same day another dose of antistreptococcus serum was injected. The temperature was 104.6, pulse 170, respiration 50, and there was complete relaxation of all the sphincters and intense delirium. Death seemed imminent, but the next day there was improvement. A fourth dose of antistreptococcus serum was injected, followed as before by an unfavorable reaction but later on by improvement. The temperature dropped from nearly 105 at midnight to about 103 in the morning. The mental condition was very discouraging, but the pulse improved, the temperature gradually became lower, and six days after the operation, and four days after the first injection of the serum the temperature was normal, and the pulse 84 to 90. The brain became clearer, and three weeks after operation the patient was convalescent. The author thinks that the use of the antistreptococcus serum saved the patient's life, although in most cases in which it has been used the results have been negative. *Richards.*

The Middle Ear in Tuberculosis.

BURNETT C. COLLINS, Brooklyn, N. Y. (*Brooklyn Medica Journal*, 1901.) Aural tuberculosis is comparatively rare, the statistics varying from two and four-tenths to seven and nine-tenths of the cases of phthisis in which the ear has been examined. The drum usually shows a large, gaping perforation. The tissues are pale, with drum and mucous membrane bleached. Granulations are rare. There is seldom a history of pain. The ossicles sometimes come away on wiping the ear with cotton. The ear discharges often contain bacilli, but may not, and the examination of many slides may be necessary. When pain is present it is probably due to secondary streptococcus infection.

The author reports a typical case, with large, central perforation and profuse discharge in a tuberculous patient in whom bacilli were found in the sputum and also in the discharge from the ear. The malleus came away while the ear was being syringed. One ear healed and then the other began to discharge.

Comparatively little can be done in the way of a cure of the ear lesion. The treatment must be directed to the general condition. Surgical measures are contraindicated except when the disease is localized. Medicinal treatment consists in keeping the ear clean by various measures, such as peroxid of hydrogen, the dry treatment, iodoform. boric acid, and gauze drainage. *Richards.*

II.—NOSE AND NASO-PHARYNX.

One of the Etiologic Factors in the Production of Deflected and Deformed Nasal Septums and the Methods for Its Relief.

NELSON M. BLACK, Milwaukee, Wis. (*American Medicine*, Feby. 15, 1902.) The cartilaginous nasal septum, being the weakest portion of the structure and lying between the bony ethmoid and the bony superior maxilla, has a tendency to bend or buckle when force is brought to bear upon it. If weakened by disease or trauma, the act of mastication, in which a force of from 50 to 300 pounds is brought to bear upon the upper jaw by the lower, may force a large proportion of the pressure upon it. The two plates will either bend as a whole, or may become separated, forming a diamond-shaped split septum. Cases of septal deformity in which the high-arched palate seems to be an etiologic factor can be satisfactorily remedied by treatment at the hands of the orthodontist. *Richards.*

Removal of Superior Maxilla for Malignant Polypus.

PUZEY. (*Liverpool Med. Chir. Jour.*, Sept., 1901.) Male, aet. 61, had a polypus growing apparently from the right antrum, filling the right nostril and obstructing the corresponding lacrymal duct. The whole maxilla and growth were removed by Fergurson's incisions. The polypus was a sarcoma of the spindle cell variety and had absorbed the floor of orbit, wall of antrum and the ethmoid cells. *Wyatt Wingrave.*

Atrophic Rhinitis Treated by Injection of Melted Paraffin into the Inferior Tubinals.

LAKE. (*Lancet*, Mar. 22, 1902.) The case having been under ordinary treatment for many years the inferior turbinals were enlarged by the submucous injection of paraffin, which has proved successful so far as the patient's comfort was concerned. *Wyatt Wingrave.*

The Correction of Deflections of the Nasal Septum with a Minimum of Traumatism.

Otto T. Freer, Chicago (*Jour. A. M. A.*, March 8, 1902), objects to the method of Asch as producing an extreme degree of traumatism. It is one without illumination; is accompanied by considerable reaction and frequently by rise of temperature, occasionally causes severe hemorrhage; is not infrequently followed by some sepsis, requires general anesthesia, and is not adapted for bony deflections.

The operation recommended is the Ingals' operation of resection of the septum, originated in 1882, later known as "Fensterresektion" of Krieg, which was an extension backward of the Ingals' operation, in that the entire deflected cartilage and not merely a triangular portion in front was removed. This operation is suitable for both angular and bowed deflections, and consists in resecting that portion of the cartilage of the septum which is affected.

A triangular cut is made on the convex side of the mucous membrane. This is dissected up, leaving the cartilage bare, and then with special knives with very sharp blades bent on the flat on the shank at an obtuse angle, the cartilage is cut through, and gradually lifted from its attachment by an elevator or spud, and cut away, after which the mucous membrane is laid back in position and a tampon inserted to maintain it.

If behind the part removed there is still deflection, it is weakened by driving a chisel longitudinally into the bone between the layers of the mucous membrane. The chisel is then withdrawn, and the bony portion fractured with the Roe forceps after the manner described by Roe.

The operative field is anesthetized with powdered cocain and suprarenal, and all bleeding points staunched, so that the operative field is at all times free from blood.

The time required is from one-half to one and one-half hours. The operation is somewhat tedious. The local anesthesia must be complete. Chloroform can be used for application of the Roe forceps, but is not usually needed.

This operation is not practicable for children under ten years of age and not after that age unless the patient can be relied upon.

The reaction is slight, and no confinement to bed is needed. At the close of the operation a tampon should always be inserted, since secondary hemorrhage after the use of the adrenalin may occur.

"The breathing through the nostril is better immediately after the operation than for some weeks afterward, as swelling and congestion of the mucosa of the opened naris and a certain amount of provisional callus growing on wounded bone and cartilage need time to be absorbed. After two months or more the nostril becomes as open as right after the operation."

This operation has the advantage of a free field of vision during the entire period of its performance, and does not require confinement to bed. Various special instruments are shown, but are not absolutely necessary.

(The reviewer has seen this operation done by Hajek, of Vienna, and has also had personal experience with it in his own practice, and can most heartily recommend it for cases in which it is applicable.) *Richards.*

Adenoid Vegetations and their Influences on the Palatal Arch.

FREDERICK H. MILLENER, Buffalo, N. Y. (*Philadelphia Medical Journal*, April, 1902), thinks that the high palatal arch and irregular, prominent teeth so often seen are due in many if not most instances to incomplete development dependent upon mouth breathing, which in its turn is due to adenoid vegetations. Before the teeth of young persons between 10 and 18 years of age are regulated, it should be ascertained whether they are mouth-breathers and have adenoids. If so, appropriate treatment should be had before correcting the teeth by dental measures.

Dentists ought to be familiar with the etiologic relationship between irregularities of development of the teeth and mouth and nasal nasopharyngeal obstructions, and prepared to suggest to parents the proper treatment.

Richards.

III.—MOUTH AND PHARYNX.

Imperforate Pharynx.

SHATTOCK. *(Brit. Med. Jour.* Feb. 19, 1901.) Reference to ten difference in origin of pharyngeal atresia and imperforate pharynx. He pointed out that the former was situated most frequently opposite the lower end of the trachea, that it arose during foetal life and was probably associated with the development of the lump; while in imperforate pharynx, the disposition corresponded with an abnormal persistence of a normal phase of development.

Wyatt Wingrave.

Acute Retropharyngeal Abscess of Infants.

PEARSON, (*Lancet*, Dec. 26, 1091). The youngest case 7 weeks old, the latest one recorded being 3 years old. Symptoms were muffled voice, difficulty in sucking and swallowing, purulent nasal discharge, fullness of neck, enlarged glands and constitutional sigus.

The treatment advised was incision behind and parallel with posterior border of sterno-mastoid muscle, just on centre of swelling; using director and directing forceps followed by drainage tube. He considered the disease chiefly in associated with cervical adenoids.

Wyatt Wingrave.

Hysterical Dysphagia.

BALL. (*West London Med. Jour*. Jan., 1902). Case of female, aet. 35 who had suffered with difficulty in swallowing food for 2 years: all her other functions were normal. Cured by passing bougies twice weekly for one month.

Wyatt Wingrave.

Follicular Tonsillitis.

ROBERT CURTIS BROWN, Milwaukee, Wis. (*Medical Record*, March, 1902.) The author believes in the protective nature of the tonsil, and that while the removal of distinctly hypertrophied tonsils may prevent the recurrence of tonsillitis, provided the crypts are entirely removed, yet it will not protect the body against subsequent attacks of sore throat or any of the infectious diseases that gain access to the body by way of the tonsil.

Follicular tonsillitis is not caused by a single microbe, but by many.

"When the streptococcus pyogenes is the cause of the follicular tonsillitis the diagnosis from diphtheria is extremely difficult; as the appearance of the membrane formed is almost identical with that of diphtheria.''

He thinks that the presence of the Klebs-Loeffler bacillus in a non-virulent form is not conclusive evidence that the case is diphtheria; the disease may be a simple follicular tonsillitis. The membrane, however, in simple tonsillitis can always be removed by a swab, and does not bleed when forcibly removed. It should have no texture, and should be non-adherent.

Whatever the nature of the tonsil, it seems by its activity to endeavor to assist nature in eliminating infection.

Richards.

Malignant Disease of the Tonsil.

F. E. HOPKINS, Springfield, Mass. (*Boston Medical and Surgical Journal*, Oct. 17, 1901.) In the great majority of cases of malignant disease of the tonsil the diagnosis lies between the round-celled sarcoma and epithelioma. Epithelioma quickly ulcerates, while sarcoma more frequently forms a rounded, smooth, distinct tumor, not ulcerated in the early stages, and appearing like simple hypertrophy of the tonsil. So far as the symptoms are concerned they are much the same. Pain is more likely to be an earlier and more troublesome symptom in carcinoma. The early pain may be referred to the ear, and the patient seek relief complaining of the ear rather than of the tonsil. The diagnosis may be difficult in the early stages of either affection.

The prognosis is always grave, death usually occurring in from six months to a year.

Whether the growth be sarcomatous or carcinomatous up to the present time operative measures have not been very successful, though occasional cases are reported in which life has been prolonged two or three years, and if the case can be operated upon early enough there may be no recurence.

The author cites a case of Dr. Coley's in which recurrence after the use of the toxins of erysipelas was delayed for eight years, though death finally occured from cancerous disease.

Details of the method of operation are given.

Richards.

Affections of the Mouth and Throat, Associated with the Fusiform Bacillus and Spirillum of Vincent.

EMIL MAYER, New York. (*American Journal of the Medical Sciences*, Feb., 1902.) Dr. Mayer reports a case of angina of each tonsil, due to the fusiform bacillus and spirillum of Vincent. The trouble lasted four weeks, accompanied by a pain of mild type, salivation, and swelling of the glands at the angle of the jaw.

The deposit in this affection may exist for some time without being noticed. It is white, soft on top, readily detachable, leaving an excavated bleeding surface. There is some induration, a fetid odor to the breadth and slight pain on delugtition in addition to the symptoms noted. The tonsils and borders of the gums, the lips and the tongue are the areas affected. The duration is from one to six weeks.

The prognosis is good, but there is great tendency to recurrence.

The question of diagnosis is of importance, as this affection may easily be confounded with diphtheria or syphilis, or mistaken for them. The bacteriologic diagnosis is all important in all suspicious cases of membrane of the throat, since a diagnosis of syphilis when the individual is innocent of the lesion would be very unfortunate. In all doubtful cases bacteriologic examination ought to be made, especially in cases in which the history is not clear and there may be some doubt. *Richards.*

The Formation of Cysts in the Faucial and Pharyngeal Tonsils.

J. L. GOODALE, Boston. (*Boston Medical and Surgical Journal*, Dec. 19, 1901.) This is a study in pathology. These cysts are lined with stratified pavement epithelium, and probably owe their origin to the degeneration following acute inflammation in which adhesions of the opposite walls at the outlet of the crypt have occurred. The inflammatory process being acute, is always most active at the outlet of the crypt, which would favor the formation of adhesions at this point.

The author has made histological examinations of cysts, both in the faucial and in the nasopharynge tonsils.

Richards.

IV.—LARYNX.

The Larynx in Eunuchs.

MAX SCHEIER (*Monatsschrift für Ohrenheilk.*, Bd. 30, No, 10) has determined by means of the Röntgen ray that ossification of the larynx begins at the age of 18 years. In women, ossification begins in the inferior cornu and the posterior border of the thryroid.

Ossification progresses gradually in front. above and below in a symmetric way, but does not extend over the entire plate. On the contrary, the anteromesial portion remains cartilaginous. In men, ossification progresses along the lower border anteriorly and advances in a shape of a small zone forward and above. Finally the entire thyroid cartilage may become ossified. Through the influence of an oriental collegue, he had a Röntgen photogram of the larynx of a eunuch from which he could establish the plan of ossification. He found that the posterior portion of the thyroid cartilage was ossified as far as the median line while the anterior portion was entirely free of bone. From which he concludes that the ossification of the larynx in eunuchs is of the type found in women.

Levy.

Case of Cancer of the Larynx with a Long Course.

DONALDSON, (*Brit., Med Jour.* May, 25, 1901.) A female, 28 years old, suffered with warts on both cords. For several years they were considered to be benign. After 6 years they were pronounced to be malignant and the patient died 3 years later. It proved to be an epithelioma. (variety not given.) *Wyatt Wingrave.*

Clinical Significance of Chronic Hoarseness and Loss of Voice

WILLIAMS, (*Bristol Med. Chir. Journ.* Sept, 1901.) An instructive epitome of the organic diseases associated early in their development with persistent voice changes.

Wyatt Wingrave.

Case of Paralysis of Right Vocal Cord Due to Thoracic Aneurysm

BARON, (*Bristol Med. Chir. Jour.*, Sept., 1981.) Male aet 50 had a "thin piping" voice of a few months duration with cough, expectoration and loss of weight. There was complete paralysis of right vocal cord, left pupil dilated and left radial pulse small, but no chest signs. Skiagraphy proved the existince of an aneurysm of the whole aortic arch. *Wyatt Wingrave.*

Case of Recurrence of Larnygeal Papillomata in a Child After Tracheotomy.

SYMPSON. (*Brit. Med. Jour.* Nov. 9, 1901.) Trachceotomy was performed on a child aet. 7 years for multiple papillomata; warts however increased and they were removed after thyrotomy: result, complete recovery of voice. *Wyatt Wingrave.*

V.—MISCELLANEOUS.

Intubation and Tracheotomy in Diphtheria under Serotherapy.

F. SIEGERT (*37 Versammlung Deutscher Naturforscher und Aerzte*) has studied the statistics of 22600 cases, especially as to the tracheotomy in comparison with primary intubation; the performance of tracheotmy in intubated hospital patients, primary as well as secondary, also where intubation is valueless. Looking at the subject from its clinical aspect only, he reaches the following conclusions:

1. Tracheotomy and intubation give a mortality of 34 per cent. in 11104 tracheotomies and 11511 intubations on hospital patients.
2. To attain these results the intubation must be primary and the tracheotomy secondary.
3. The greater frequency of tracheotomy corresponds to the results in intubated hospital cases.
4. Mortality has not been lessened by the change from tracheotomy to intubation in hospitals.
5. The use of both methods only gives the best results possible. *Levy.*

The Present Status of Intubation.

J. VON BOKAY, (*37 Versammlung Deutscher Naturforscher und Aerzte*) presents this subject in the light of his own experience, 1271 cases, and of the literature of intubation. He believes that primary tracheotomy should only be performed in those cases in which severe pharyngeal stenosis is present in addition to the larynx stenosis, and where no result appears possible from intubation on account of the edematous swelling of the laryngeal orifice.

Since the introduction of serotherapy, it has been possible to refrain from the operation in 37 per cent. of the cases. He performs intubation in private practice as well as in hospitals. In country practice, tracheotomy must be performed when it is impossible to secure an intubationist. He does not believe that intubated children are especially predisposed to catarrhal pneumonia nor is foreign body preumonia common. The danger of loosening the pseudomembrane with the tube is insignificant. He uses intubation with advantage in syphilitic stenosis, other cicatricial stenoses and laryngitis subglottica. *Levy.*

A Remarkable Case of Tuberculosis of the Trachea and Varix Formation with Fatal Result.

GIDIONSEN (*Munch. Med. Woch.*, 1901, No. 42) reports a case of a woman aet. 41 years who had been affected with severe emphysema for a year. No tubercle bacilli were found in the sputum. After a febrile attack she was suddenly taken with a severe pulmonary hemorrhage causing death by asphyxia. The lungs on section were found free from tubercular changes. In the trachea were found several varicose dilated veins, one of them lying just over the bifurcation; on the posterior wall an ulcer as large as a penny which was shown by microscopic examination to be tubercular. Both bronchi were filled with coagulated blood. As the other parts of the body were not examined post mortem it cannot be said positively that this was a case of primary tuberculosis of the trachea. At any rate the emphysema caused the dilatation of the veins of the trachea. The tubercular ulcer was independent of this, clearly accidental as to its occurance in the neighborhood of the veins, though it caused their arrosion. The hemorrhage would undoubtedly not have caused death, if the severe emphysema had not made strong expiratory efforts impossible. *Levy.*

The Preventation of Moisture Clouding of Mirrors.

DOWNIE (*Med. Press Lon.*, Mar. 5, 1902) recommends "le crayon antibuse."

(The well known soap method leaves nothing to be desired.—Abstractor.) *Wyatt Wingave.*

Observation on Lyarngeal Intubation.

GOODAL. (*Edinburgh Medical Journal.* March, 1902.) 101 cases treated by Bayeau modified O'Dwyer's method. An appreciatory article. *Wyatt Wingrave.*

Tortuosity of Internal Carotids.

MOORHEAD (*Brit. Med. Jour.*, February 8, 1902.) Experience as a demonstrator of anatomy led him to consider the malformation to be a very common one. It was generally bilateral add occured in old age and was probably due to arterio-sclerotic changes. *Wyatt Wingrave.*

Tent Life and Simplicity In Therapeutics as Factors in the Treatment of Phthisis Pulmonalis.

WM. K. ROBINSON, Denver, Col. (*Therapeutic Monthly*, December, 1901.) The author gives a report of two years experience in a colony of tuberculous patients living in tents on the plain east of Denver. The results have been satisfactory. Simplicity of life in the open air, with the administration of few drugs, was the main feature of treatment. In very cold weather the cases did as well as at any time and many patients preferred to sleep without heat, although stoves were provided in the tents.

Reconstructive metamorphosis is the greatest antagonist of the bacillus of tuberculosis; this is best accomplished by complete and rapid exchange of the gases; involuntary gymnastics at moderate altitude; personal hygiene; nutritious food; mental and physicial rest, well-regulated measure of exercise, such few drugs as may stimulate the weakened digestive and circulatory functions, and such other drugs as may be needed to regulate the excretions and secretions, while alleged specifics are abstained from. All this is best attained by a life of freedom so far as possible in the open air, and it may be accomplished irrespective of altidude and meteorologic or other climatologic conditions. *Richards.*

Rhino-larynyologic Reports.

H. VON SCHROTTER (*Montatsschrift fur Ohrenheil.* Bd. 35 No. 10) reports a case in which a sound was thrust into the cranium—into the brain, as shown by the Röntgen rays. Autopsy showed the existence of a tubercle in the dura.

He was able to establish the influenza bacillus as the cause of a case of empyema of the antum.

In a case of nephritis, a severe edematous swelling of the aryepiglottic fold occurred; in two others extensive edema of the epiglottis. In all these cases which seemed to indicate tracheotomy, the writer removed the swollen parts with a cold snare. Scarification in insufficient for such cases,

He observed a case of chronic idiopathic edema in which there did not appear to be any assignable cause and he concluded that this must be considered as analagous to elephantiasis.

A diaphragmatic closure of the larynx at the level of the local bands existed in a case of scleroma. The membrane was cut and the voice became clear and the breathng free.

He advises that the characteristic changes of the epiglottis in typhoid be looked for in all cases where there is the least suspicion of typhoid.

The thyroid gland appeared to be the primary seat in a case of achinomycosis. After the cyts had been thoroughly emptied, an infiltration appeared above the clavicle and later in the sinus pyriformis. It was necessary to incise both, after which recovery was complete.

A case of carcinoma of the mouth was cured by curetting. Autopsy of a patient who during suffered from total paralysis of the left recurrent, showed that nerve lay between the aorta and a dilated ductus Botalli and in this way the pressure on pulsation caused the paralysis. The cause of another case of recurrent paralysis lay in a metastatic carcinoma in the mediastinal lymph nodes with rupture into the trachea.

Stenosis followed a cancerous metastasis of the trachea. Extensive stenosis at the bifurcation was caused by swelling of the bronchial lymphnodes in two cases. In one of these cases, retrograde metamorphosis occurred through cicatrization, then it remained stationary.

In a case of syphilis, an extensive cicatrix, 5 cm. long transformed the trachea into a tube whose lumen at its narrowest point was 4 mm. in diameter. All efforts at dilatation were unavailing so that section of the trachea was necessary. As a consequence, suppurative mediastinitis arrosion of the innominate artery and death from hemorrhage followed.

In three cases of tuberculosis of the trachea, difficultly of breathing was the most important symptom. Dilatation with short bougies gave favorable result.

In a case of diverticulum of the esophagus, the writer stuffed the sack with long strips of iodoform gauze making it possible to show the topographic relations by means of the Röntgen rays. *Levy.*

PROCEEDINGS OF THE MIDDLE SECTION, AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAS SOCIETY, AT ST. LOUIS, FEBRUARY 22, 1902.

H. W. LOEB, M. D., CHAIRMAN.

Dr. C. R. Holmes read a paper entitied,

Enormous Naso-Pharyngeal Muco-Fibrous Polypus with Macro- and Micro-Photographs.*

Dr. O. J. Stein, Chicago: To me the remarkable feature in the report of this case, aside from the enormity of its size and the facility and dexterity exhibited by Dr. Holmes in removing it, is the fact that so little hemorrhage accompanied the operation. It is true the case is one of the soft fibrous form of naso-pharyngeal polypi which would probably account in part for the lack of hemorrhage. Another reason, in my judgment, is that it had a small pedicle; the third reason is the method which was so ingeniously adopted by the operator in removing it by torsion or twisting; a fourth reason was the lack of adhesions within the naso-pharynx, as I understand the case.

Reference was made by Dr. Holmes to the rare appearance of adhesions within the naso-pharynx and nares in the fibrous forms of naso-pharyngeal polypi, and it is generally understood that we seldom have adhesions there. I have the record of one case showing two adhesions. It was a polypus about three inches in length presenting two adhesions within the nose and naso-pharynx. So extensive was it that the snare used anteriorly was inadequate for removing it, and I had to resort to scissors and finally extracted it through the anterior nares, which was done with great difficulty. It shows that occasionally we meet with these growths of a fibrous character in the naso-pharynx, with adhesions.

Dr. J. A. Stucky, Lexington, Ky.: None of you are more interested in the report of this case than I am, because I had a rather startling experience with two cases.

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*See page 295.

These cases I shall report in detail at the next meeting, in Saratoga, and will only refer to them now.

A boy, of seventeen years, came to me, with a growth very much like that described by Dr. Holmes, and evidently springing from the vault of the pharynx, pushing the soft palate forward; it did not quite reach the epiglottis, and one horn bordered on the anterior nares. There were adhesions to the septum and it was impossible to do anything with the snare. I had an extra-strong steel snare made, having broken No. 5 piano wire several times, and had to use a plumber's forceps to hold the canula and tighten the nutscrew. The way the patient bled was frightful. Unable to relieve him, I took him to the Kentucky State Medical Society, and was advised by leading specialists to let the case alone. A section was cut off and sent to New York, and a diagnosis of fibro-adenoma was made. I called in a general surgeon, who did an external operation, separating the nose, and, after my putting a loop around the base of the growth and tightening it, the surgeon went into the antrum and cut out the growth with knife and scissors. The snare controlled the hemorrhage to some extent, but we had to use the galvanic cautery in the posterior nares at the base of attachment. After remaining in the hospital for several months, he made a good recovery.

The second case was in a boy of fifteen years. This growth also sprang from the vault of the pharynx, one horn bordering on the anterior nares. That portion, I succeeded in snaring pretty well, and got it out. The growth bordered on the posterior nares, down below the soft palate. I attempted to use the nasal snare, but found this impracticable; so, I slipped another snare over it, pushed it well up, tightened the wire and tried to cut it off, but could not do so. The snare was allowed to remain in position for 18 hours, tightened every 30 minutes. At the end of 13 hours the growth was loose, but would not come off. It was finally twisted and torn off. In both of these cases, especially after my first experience, I was prepared for hemorrhage.

Dr. W. L. Ballenger, Chicago: Soon after going to Chicago, a case came under my observation, and when I first saw it, I did not recognize the character of the growth. It seemed to be an ordinary polypus, protruding at the anterior nares. I introduced the snare around this portion and attempted to remove it, and had a similar experience to that already recited here, namely, I could not get the snare to cut through the growth. The symptoms presented by the patient, when I first saw him, were very striking and, if I had had more experience, I should have easily recognized the nature of the growth then. The boy was 12 years of age. When sitting in a chair, he would often seemingly go to sleep while examining him. With rough handling, he could be aroused, only to relapse into his former condition. At a subsequent sitting, under general anesthesia, the growth was partially removed. The operation was stopped when the patient was at the point of death, from hemorrhage. Normal saline solution was injected and the patient recovered. He was placed in the hands of Dr. Carl Beck, who performed a radical operation.

I consider the essayist's paper very comprehensive—one that will be referred to, in years to come, as a standard on this subject.

Dr. Norval H. Pierce, Chicago: I have been counting up the cases of post-nasal growth that I have seen. I recall eight. Five of these came to operation; three were not operated upon as far as I know. Of the five operated upon, 2 died on the table, 2 died within 10 days, and the other got well. They were all fibro-sarcomas and grew from the base of the sphenoid bone, and operation consisted in temporary excision of the superior maxilla. Koenig has made a voluminous report of cases of tumor originating in the post-nasal space, and found that over 90 per cent. originating in the prevertebral tissues were sarcomatous—fibro-sarcomatous. Though not as malignant as a purely sarcomatous growth, these have a tendency to recur after complete, or as far as possible complete, extirpation, and possess a tendency to invade neighboring cavities such as the orbit, the antrum, the zygomatic fossa, etc. Therefore, we should not forget that tumors which originate at the base of the sphenoid have an entirely different significance from tumors originating elsewhere in the posterior nasal space and nasal fossa. They are not pedunculated as a rule, but have a broad base and give entirely different results in an operative way; first, because they are sarcomatous, next because they originate nearly always about puberty, and the patients at a very early date become anemic because of the recurring hemorrhages from the surface of the growth. This anemia occuring at this period of life is apt to produce degeneration of the myocardium. In this way we can account for the enormous number of deaths on the table when such growths are operated upon. It is not alone because of the hemorrhage during operation, but because of the effect of ether upon a degenerated heart. I believe we would have a better chance if we tied the carotid and allow a few days to elapse before proceeding with the operation. In this way we diminish the dangers of hemorrhage. Above all, however, I think we should never, in these cases, operate through the posterior nares with the nasal snare. In cases of pedunculated pure fibromas it is different. When the operator possesses sufficient skill to extirpate them through the natural passages an external cutting should not be considered. Those who know from experience the difficulty with which tumors in this region are removed, will, I am sure, join me in congratulating Dr. Holmes on his brilliant results.

Dr. Stucky: Would it not be a good idea to put the snare on to control the hemorrhage?

Dr. Pierce: The hemorrhage would be better controlled by tying the carotid. The operation of temporary excision of the maxilla is exceedingly bloody.

Dr. W. B. Shields, St. Louis: I have seen two cases, one operated on by Chiari without the use of general anesthesia, this growth springing from the base of the sphenoid. The hemorrhage was enormous — I think the patient lost a pint of blood in half a minute. The assistants were very skilful men and the hemorrhage was stopped promptly. This was a fibroma. The other was operated on by Dundas Grant, in London, but was a polypoid growth on the posterior surface of the ethmoidal region. It was pedunculated and removed without much hemorrhage.

Dr. Jos. Beck, Chicago: Referring to the case mentioned by Dr. Ballenger I will say when the boy came to us he was extremely anemic—almost exsanguinated—he was observed for about three weeks before anything was done. The patient presented the typical frog face, with exophthalmos. This was probably due to pressure upward into the cranial cavity or possibly from absorption of toxic secretions, which were present in large amount. An effort was made to improve his general condition during the three weeks, then the operation of Langenbeck was performed, the carotid artery being primarily ligated. The typical incison was made along the side of the nose and the soft palate split, as in temporary resection of the superior maxilla. A tumor was found and showed that a small projection had been cut off. There were marked adhesions at the point where the operation was attempted and the bleeding was considerable. The hemorrhage was controlled, and the tumor was found to pass into the antrum, the origin found near the opening of the antrum and the same filled out with the tumor mass. On section it was found to be a true fibroma with a vascular capsule. The cavity was thoroughly cleaned out and all the tumor that could be reached was taken away, the cavity packed with gauze, the jaw replaced and the boy made a good recovery. I saw him six months ago and to all appearances he was practically well.

I recall another case operated on at Kaufmann's clinic. The electro-cautery snare was used. It was a fibroma in a young man. The tumor was removed at different sittings by Dr. Vimula, with very little bleeding. My brother, Carl Beck, has reported 5 cases purely sarcomatous. Two originated from the pterygoid region, passing outward and giving the appearance of a tumor back of ramus of the lower jaw. A sarcoma, was firmly attached to the lower portion of the pharynx. Three cases are reported recovered; one case died several months later, and another died two hours after the operation, which was a permanent resection ef the upper jaw because of involvement of the jaw proper.

Dr. M. A. Goldstein, St. Louis: Emphasis should be made upon the early and prompt microscopic examination. This appears to me as a most important feature when dealing with this class of cases, first, because the difference between a malignant and a benign growth will materially determine the prognosis, and second, because the difference between the benign and the malignant will determine, to a certain extent, the form of attachment of the growth. As a rule the simple fibroma is pedunculated and the malignant has a broad base attachment; this is of some practical importance in the mechanical handling of the case and may have a bearing on the method of removal of the growth at the time of operation.

Dr. H. W. Loeb, St. Louis: I would like to refer to a case which under my observation and which is thoroughly in line with what Dr. Holmes said. I have seen three cases of what can be called the soft fibroma type as reported by Dr. Holmes. One case occurred in the practice of my preceptor when I was still a student and was removed by grasping it with the finger and pulling it out. Another I removed early in my practice by means of a snare. This growth extended down to the uvula. The third case was about a third or a half as large as Dr. Holmes' case and extended below the palate. It was grasped and pulled up without hemorrhage.

Of the hard variety I have seen five cases. One of these has been reported under the name of adenocystoma vasculosum. It was a case in which the growth straddled the septum, both ends being delivered through the anterior nares. There was no exophthalmos.

The next case I was one case of naso-pharyngeal fibroma and extended about half way dawn the epipharynx. In addition to these I have seen two other cases diagnosticated by microscopic examination as sarcomata. I want to say here that I have not much confidence in the diagnosis of these cases by the microscope. One of these cases is now well. One was said to be a round celled sarcoma the other a spindle celled sarcoma growing from the base.

In the case where the septum was straddled I started by taking what I could with the electro-cautery snare. There was hemorrhage of course but this was controlled. After taking off several masses with the snare I decided to follow the plan of electrolysis. I found this had a great influence upon the vascularity of the tumor which was gradually lessened so that I could remove the pieces with the snare and the cautery knife without great hemorrhages. I am sure the electrolysis modified the growth because after a year it has practically disappeared and to-day the only thing noticeable is an atrophy of the bones and mucous membrane.

Another case in which the growth was practically confined to the epipharynx was so-called sarcoma. He was under observation for two years and though still living, he has passed out of my hands. In this case the mass grew from the left side, mainly around the eustachian tube, covering up in the beginning. not only the left side but also the right side. I started to work with the snare and had the same experience encountered by Dr. Stucky. The hemorrhage was enormous. All these patients have very tractable pharynges and palates, so I carried a piece of gauze into the phaynx and the hemorrhage stopped. I did the operation at intervals of about six months and when I last saw him there was practically no recurrence. The patient is getting along toward that age where, in my experience, these growths have a tendency to disappear. Judging from the literature on the subject these growths do tend to disappear without treatment and I believe if we do operations of less extent than as proposed by Dr. Beck we would have more satifactory results. Another case in which I removed a mass is still under observation.

Four of my cases have been in German farmer boys from 15 to 18 years of age and one in a German girl.

I feel that Dr. Holmes' paper is a distinct contribution to this subject, especially from the standpoint of designating these growths as they should be. As to the fibromata I am in favor of following the histologic classification even if we have to say one is "soft" and one is "hard," because as Dr. Holmes has shown, there is a decided difference in the two conditions as to the progress of the case, the prognosis, treatment and age of the patient.

Dr. C. R. Holmes, Cincinnati: We should absolutely consider these as not sarcoma. Sarcoma is malignant. None of these come under that head. One variety may be classified as fibroma-sarcomas but even then they are not malignant. We have sarcomas of the pharynx and the nose, but they are entirely distinct from this form, and do not come under this classification. The removal of the tumor reported to-day was very simple and without danger but it is perhaps interesting because of its great size and rarity. The firm fibroma is a dangerous growth on account of its great vascularity. It also had a broader point of attachment. It starts from the fibrous tissue and as it grows it forms adhesions, frequently giving the appearance of having a broad base, but these adhesions do not tend to cause the spread of the tumor. Destroy the nutrient artery in the pedicle, and we kill the tumor.

I want to congratulate Dr. Stucky on the result of his operation, and to thank the society for the interest manifested in my paper.

Dr. J. A. Stucky read a paper upon

Some Naso-Pharyngeal Manifestations of Systemic Disturbances.*

Dr. C. R. Holmes: I desire to say that if we succeed in mastering the subject just referred to, it will have been worth our while coming here. I have studied it for the last three years, began studying it in connection with catarrhal deafness, because I had become tired of the routine inflation and swabbing with such poor results in naso-pharyngeal and aural catarrh. One of the first things we should do is analyze the urine and thoroughly study the the action of the bowels and stomach, and I am glad to say that we can now do vastly more for these catarrhal patients than we could a few years ago. As yet we have not mastered this question, but we are on the right track, and if we will carefully study this subject along these lines, and recognize that it is not local treatment alone we must practice, then we shall soon be able to successfully treat the majority of these cases.

I consider the paper very important, and I am glad the Doctor has taken up the subject in a scientific manner.

Dr. Robert Levy, Denver: This subject is certainly very important, because of failure to obtain satisfactory results by former methods of management. We are in the infancy of the study of this trouble and, after treating a case for a certain length of time, are brought face to face with a helplessness which discourages us and our patients. I have seen many cases, in our high altitude, that might be classed as lithemic throats attended with lithemic manifestations, which also present neurotic symptoms during all times of the year. I have tried to explain this on the ground of nervous irritability, and have found it necessary to explain the increased nervous irritability by some other condition, and in the end have reverted to the lithemic explanation. But the question arises: Why is it that many of these cases of apparent, so-called lithemia have this excessive neurotic habit? I am frank to say that, after having gotten along so far in the explanation of the condition, I am again at a loss to account for so many of the cases occurring without the usual lithemic manifestations, without the accompanying urinary analysis, without the accompanying habits of life that we look for, yet presenting exactly the same symptoms. Take an individual who lives on little meat, leads an active life, whose urine is large in quantity, etc., and yet he will present these very symptoms. Those are the cases that puzzled me more, perhaps, than the overfed, meat-eating, liquor-drinking persons.

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*See page 254.

I feel that the paper is a valuable one, particularly in reference to the examination of the stomach after a test meal and the general examination.

Dr. Holmes: I have gotten to the stage where I have printed diet slips with instructions on them, which I hand to patients, with directions what they must and must not do. I write the name on the slip and, if necessary, modify it for the different cases.

Dr. W. L. Ballenger, Chicago: I don't think we have yet, nor do I think Dr. Stucky believes we have, arrived at the final solution of this problem, but I believe Dr. Stucky is working along the right lines and has added to the literature on the subject. The large intestine is the seat of the absorption of putrefactive and deleterious material. If we can keep that portion of the bowel clean, these patients will improve materially. This can be done in two ways, as described by Dr. Stucky. He gives preference to colon flushing. It can be done, also, by the use of alkaline cathartics. The beneficial results are not so much from absorption of alkaline substances into the blood, as from the antiseptic or antiputrefactive effect upon the intestinal contents. I believe one of the most beneficial effects is the retarding of this putrefactive process, especially that which produces the toxins so poisonous to the system. The point I wish to emphasize is that we should not attempt to do so much by dieting as by regulating of the intestinal tract.

Dr. Levy: I referred to cases which seemed lithemic through alimentary poison. It is a well recognized fact that toxins absorbed from the lower bowel are the cause of the neuroses. That has been my experience, and it has been demonstrated to my satisfaction that neuroses manifest themselves in proportion to the lack of cleanliness of the lower bowel, which, if properly attended to, will materially relieve the neurotic symptoms.

Dr. O. J. Stein, Chicago: As the discussion has not followed the text of the essay very closely, I feel licensed to refer to some conditions further down in the oro- and laryngo-pharynx. It might explain some of the so-called neurotic manifestations referred to by Dr. Ballenger and Dr. Levy. I refer to conditions about the base of the tongue. I have found that patients with rheumatic or so-called lithemic manifestations who improve markedly under antirheumatic or antilithemic remedies, but not entirely, frequently have trouble about the base of the tongue. Nothing particular may be seen, but, pressing a probe into the follicles and recesses, and with the application of astringents and massage, there is a disappearance of the gravity of the symptoms which remain after the patient has taken antilithemic or antirheumatic remedies. Whether this is psychical or not, I leave to your judgment; but I do not believe it is.

Dr. Stucky: I will say that some of my ear cases improve more rapidly and more satisfactorily under systemic treatment than they do under local treatment. The diet slips mentioned by Dr. Holmes are excellent, but we must know what diet to prescribe for our patients—we must know the exact condition of the gastro-intestinal tract. One of the most prominent men in Lexington came to me with a typical lithemic throat as I thought, with a spasmodic cough almost like a whooping cough and hyperemic condition of the larynx, and no relief was obtained until the alimentary canal was cleansed out. I believe the neurotic condition of many of these patients is due to an auto-intoxication. With reference to saline purgative, I think most of these cases can not well bear the drain of frequent salines. If we keep up the colon flushes daily or nightly until we get the gut clean we can then keep it clean. The paper was directed first to the gastro-intestinal tract next to the skin, and next to physical exercise.

Dr. Levy: You speak of a "typical lithemic throat." What is it?

Dr. Stucky: A congested condition of the mucous membrane, a stiffness of the muscles, a pricking as if a foreign body had lodged in the throat, general malaise, and the throat always worse after eating heartily or indulging in fermented wines. The local appearance is simply that of congestion with the follicles of the tonsil sometimes plugged up, which a spray of hot alkaline solution will relieve.

Dr. M. A. Goldstein: If a man comes to you with a tickling in his throat, an irritable cough, who is not willing to forego the pleasures of his usual diet and drinking, would you have his colon flushed for a week or two?

Dr. Stucky: Acute cases do not require this method. I simply make it a matter of business with the patient and tell him that if he wants to get rid of his trouble he must submit to the treatment for a while, be careful of his diet and do the things I direct. After he has experienced some relief and the canal has been cleansed he will usually be willing to stick to the treatment.

Dr. Shields: Do you allow hay fever patients to have nitrogenous food?

Dr. Stucky: It depends upon the analysis of the stomach contents and the urine.

Dr. Shields: I have been perplexed by these cases. It is said the majority are due to an intestinal auto-infection and that nitrogenous food is not digested in the intestines.

Dr. Stucky: Often there is a little fermentation in the stomach which nothing relieves as much as washing out the stomach. Some of these patients get along better by taking 6 or 8 ounces of pure water every 2 or 3 hours than anything else.

Dr. N. H. Pierce, Chicago, read a paper on,

A Case of Congenital Fistula of the External Nose.*

Dr. Levy: I would like to ask if you considered the treatment by galvanic cautery or other cauterization before attempting the radical operation?

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*See page 258.

Dr. Holmes: How far did it go in through the nose from the bridge?

Dr. Pierce: It dipped down around the outside of the bone and then went inward. There was a communication with the anterior nose, but in all probability that would heal over and when sufficient material had collected to cause pressue it would break through the nose. She gave a history of this breaking through at intervals.

Dr. Ballenger: Did I understand you to say the case was congenital, and when the patient applied to you there had been no history of fistula?

Dr. Pierce: No, there was a history of dermoid at first. These fistulæ rather show this at first. We know there are congenital cases due to incomplete coaptation of the nose.

Dr. Beck: How large was the growth primarily?

Dr. Pierce: The patient described it as a little larger than a cherry when the cavity was infiltrated. There was a slight depression along the dorsum of the nose. It was very marked looking at the profile. The depression extended from the middle of the nasal bone to below the tip. There is little doubt but that trichloracetic acid would have been effective in this case at first. I have seen auricular fistulas heal in this way without other treatment. These fistulæ begin as dermoids and not as an open fistulæ.

Dr. Robt. Levy, Denver, read a paper entitled,

Essentials in the Treatment of Laryngeal Tuberculosis.*

Dr. C. R. Holmes: I would like to ask if it is necessary still to use iodoform in these cases.

Dr. Norval H. Pierce. I have not seen a great many cases of laryngeal tuberculosis in America. In Chicago, at least, we do not see many cases. My experience would lead me to think that all manner of treatment is more or less futile. I believe advance must take place in the direction of early diagnosis and early diagnosis means, as Dr. Levy has pointed out, the early recognition of certain symptoms which are apparently common to a number of diseases, such as anemia and tumefaction in the arytenoid space. I know of cases that have been sent away from Chicago, and positions of some importance given up, because of a laryngeal anemia and vague symptoms in the larynx which were apparently recognized by laryngologists as the precursor of tuberculosis of that organ, but there was not tuberculosis either on the larynx or the lungs. It has been mentioned by some writers that the pale gray, circumscribed miliary tubercles can be recognized at a very early stage of the disease, lying under an anemic but unchanged mucous membrane. I have never seen this condition. We know that by far the most frequent point of attack is in the arytenoid space while the vocal bands, especially the upper parts of the vocal bands—the part we can see most plainly are comparatively early affected at an early stage of the disease. The operative procedures that I have adopted in certain cases have never led to any permanent relief. I have curetted the tubercular masses away from the interarytenoid space and have re-established vocalization in some of these patients but sooner or later the disease recurs. The treatment with lactic acid I believe to be more or less empirical. When we consider the numerous cases treated with lactic acid in its various strengths, and appreciate how very very rarely we see recoveries, the question arises in my mind whether or not these patients would not be better of without the irritating effects of the acid. Acting on the discovery of Koch that the oil of cloves is more toxic to the tubercle bacillus than the double chlorid of mercury I have used a solution composed of lactic acid, oil of cloves and acetic ether sufficient to cause the solution to become perfectly clear. The lactic acid and oil of cloves may be reduced in strength according to the wishes of the operator and both may be modified by the addition of glycerin. I believe this treatment has some advantage over the oil of cloves and lactic acid used singly. In one of the worst cases I have seen the patient did not, at least, get any worse in a very long time. To determine whether or not the mixture has any particular advantage would have to be determined by a widespread use, and I mention it simply as a suggestion. It at least has logic for its support.

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*See page 196.

Dr. M. A. Goldstein, St. Louis: There are two clinical phases which have recurred in my work time and time again. In the first place I have noticed in many of these superficial laryngeal ulcerations after closing over these little ulcerated spots, if the patient remains in the same environment or the same climatic conditions, there is an occasional and sometimes rapid recurrence of the ulcerations over the same areas. I have combatted this condition in the prescribed way but nothing seems to prevent these ulcerations, and I have found nothing to bolster up the laryngeal mucous membrane so as to prevent this superficial sloughing.

The other question is in cases where the general condition of the patient and much of the clinical history of the case would indicate a tubercular involvement but no definite primary lesion could be determined. I have been called upon to determine the laryngeal condition in certain cases but have been unable to find any distinct laryngeal association with a tuberculous condition. There is nothing sufficiently well marked in the clinical data, in the surface appearance of the larynx or in the general condition of the patient to fix a diagnosis of tuberculosis. I have thought that perhaps Dr. Levy from his vast experience in his section of the country with these cases could dilate upon this phase of the question.

Dr. Ballenger: I simply wish to refer to one phase of Dr. Levy's paper, which has also been mentioned by Dr. Pierce, namely, the very great value of the early recognition of the tubercular lesion. Dr. Levy mentioned the three cardinal symptoms in the early recognition of laryngeal tuberculosis and I want to mention my experiences in that particular. A young lady came to me with an affection of the larynx and on examination I found the peculiar ashen-gray color of the mucous membrane. I did not examine her chest. She had been to the leading chest specialist of our city, who had been unable to make a diagnosis; her sputum had also been examined by our leading pathologist who was unable to find the tubercle bacillus. Immediately after this she came to me. I recognized this peculiar condition of the larynx and told her to go back to these men for further examination. I wrote a note to each of the gentlemen telling them what I had found and asked that they make further investigations—that I believed the patient had tuberculosis in the incipient stage. She went back to them, the tuberculin test was made and a very marked reaction took place. She has since developed a typical tuberculosis. I had an exactly similar experience in another case. Personally I have considerable confidence in the ashen-gray color of the mucous membrane and the roughened condition of the interarytenoid space as early signs of tuberculosis. In the treatment of these cases I believe the use of the curette should be followed by lactic acid. It is important on account of the lymph spaces which surround the mass of tubercular infiltration. It is probably impossible to remove the entire mass from the larynx by the simple use of the curette and in order to still further eradicate the tuberculous tissue use of lactic acid should be resorted to. This will still further destroy the tuberculous tissue and thus prevent the extension of the infection through the surrounding lymph spaces. I believe this is one reason why so many cases recur after operation—the work is not made complete.

Dr. Stein: Contrary to the experience of some of the speakers, I think we, as laryngologists, do see a great many cases of tuberculosis of the larynx, and make a diagnosis by looking into the larynx. I think I have. I believe I have made a diagnosis of tuberculosis in many of my cases upon the essential findings, as pointed out by the essayist. While I believe this is often done by inspection, I do not place so much reliance upon that as some do. And I consider of importance in the diagnosis not only the ashen-gray appearance of the larynx, but, also, that of the pharynx, and particularly the inter-arytenoid outgrowths. Many of these little projections are apt to be overlooked unless the examination is extremely careful. They may not be seen in the first or second examination, but after several examinations these things are brought out clearly.

In the treatment of these cases, I employ a method somewhat similar to Freudenthal's, of New York, whom I saw treat a number of cases there. By this method, I have had, almost invariably, good results.

Dr. Beck: A case is at present under my observation where the diagnosis was not at all difficult, because the general symptoms were so pronounced. She is a colored girl, sent to Denver because of her general condition—there being large cavities in the lungs. We know that tubercular laryngitis, as a rule, is secondary, so that with hoarseness we expect to find a mass in the interarytenoid space. This mass, she tells me, she has felt in the throat for six months, and it is quite large. In this case, there was no sign of ulceration or any tendency to it. I put the patient on general treatment and thought I would try what had been tried in the Leipzig clinic—subcutaneous injections of hetol or cinamic acid. This being a clinical case, I was able to give it full attention. I cannot say whether it was the general treatment or the injections of hetol, but I am very much pleased as to the condition in the larynx. There is not a disappearance, but there is a relief, and the movement in the interarytenoid space is much more free. Three cases were treated by Kauffmann with intravenous injections of hetol, during my stay at the Bohemian Aural Clinic, at Prague and, so far as I can recollect, there was considerable improvement following this treatment.

Dr. Shields: I have found the insufflation of orthoform very good. I agree with Dr. Pierce, that lactic acid is not satisfactory—it has not proved so in my hands. One effect of orthoform is that it produces a necrosis of the parts. I do not believe mucous membrane can form where orthoform is used, because of the necrosis produced by the drug; the necrotic tissue protects the ulcerated surface. Some years ago there was much enthusiasm over the hypodermic use of solutions of guiacol in tubercular enlargement of the larynx, but in recent years I have heard little about it. I would like to ask Dr. Levy what his experience has been with the use of orthoform powder?

Dr. Pierce: I do not want to be misunderstood in this statement, but when I refer to thickenings in the interarytenoid space, I mean those seen in the stages of tubercular laryngitis. I do not want to be misunderstood as asserting that these thickenings are not almost pathognomonic of tubercular laryngitis, but they are not an early symptom of the disease.

My experience with orthoform has been disappointing, to say the least. We have all had experience with the terrible pain, the distress—the ceaseless distress—which is present in the later stages of tubercular laryngitis, when the epiglottis is ulcerated off, the arytenoid regions ulcerated and deglutition is accompanied by exquisite pain. I have used orthoform in these cases, and not once has relief been afforded. On the contrary, I have found it very irritating, although used with olive oil. In the last case in which I used this powder, I found marked edema following each application, and the patient refused absolutely to allow its employment.

Dr. Stucky: In my experience, which is limited, I have found a longer period of relief following a weak solution of chromic acid than by using lactic acid. My experience with orthoform has been similar to that mentioned by Dr. Pierce—I have found it rather disappointing.

Dr. W. E. Sauer, St. Louis: My own experience is limited, but I would like to call attention to one or two points which Dr. Hajek, of Vienna, lays special stress upon in regard to curettement of the larynx. He advises that the patient be observed two or three weeks, taking a daily record of the tempertature, and watching the appetite and especially noting the condition of the larynx. If there be high temperature, the appetite poor, and the process in the lung making marked advancement, he advises not to curette. On the other hand he advises curettement when the general condition of the patient is good and there is little if any fever. He always follows the curettement by application of a concentrated solution of lactic acid. He, with others, does not operate nearly so often as formerly.

Dr. H. W. Loeb: I have run the gamut of the various methods and have experienced the enthusiasm that has waxed rapidly and waned more rapidly over the different methods of treatment and finally I have tried the method of Freudenthal. With his particular solution I have had more or less satisfactory results, perhaps because I have not had sufficient experience, although I have seen quite a number of cases. Men with the experience that Dr. Levy has had in this line of work, who are able to establish a certain line of treatment with certain indications can do the rest of us a great deal of good.

I recall my experience with tuberculosis serum in these cases. Of the cases reported about six years ago one is still living. He was examined by Dr. Porter, Dr. Mulhall, Dr. Glasgow and all, in agreement with my own view, pronounced the disease laryngeal tuberculosis of an advanced type, saying the patient would probably live three months. He received no local treatment but was treated with the serum. While he improved under the serum, he also improved when the serum was discontinued. I think it was one of those cases of laryngeal tuberculosis that get well in spite of treatment. At the present time I am inclined to use the Freudenthal method on the cases that come to me. It certainly relieves the pain and if we can do nothing else we can promise them more or less ease. I have used the menthol solution in rather weaker strength and also orthoform. We want to learn a great deal more about laryngeal tuberculosis because as a rule the treatment of the larynx is a small thing so for as cure is concerned. My treatment of the larynx is in the direction of keeping the patient from starving to death. I don't anticipate curing them, but to relieve the pain.

Dr. Fayette C. Ewing, St. Louis: About six years ago a case come to me presenting rather obscure symtoms. I put him on hypodermic injections of bichlorid of mercury and the saturated solution of iodid. I took him to Dr. Mulhall, who said there was no doubt that it was a case of laryngeal tuberculosis. I examined the chest but could find nothing then, nor did Dr. Mulhall. Later I went over the case again and found one little crepitating spot. I took him back to Dr. Mulhall, who agreed with me, and I proceeded to treat the patient with applications of lactic acid applied with a swab. The ulceration apparently healed up and he has been living in this town since then, being head cornetist at one of the theaters. He played at Cataline Island all last summer and I was afraid the extra hard work would bring on another attack but he is still blowing his horn. Being a poor man I could not take him away from this work which I felt was congesting the larynx and increasing the tendency to spread, in which Dr. Mulhall agreed. The man weighed 125 pounds when he presented himself to me, and since his cure, which I am justified in designating it since he has been well so long, has kept up to 160 lbs. He is very hoarse there, having been considerable tissue destruction with cicatrization.

Dr. Levy: Many of the questions raised in the discussion have been answered by other gentlemen taking part in the discussion. In regard to iodoform I recognize that the odor is disagreeable, and some patients experience discomfort from its use. I have tried to find a substitute, but have always gone back to iodoform. What it is in the drug that gives better results, I am not prepared to say, but I have ceased to substitute anything for it. Early diagnosis is a subject upon which we might elaborate at great length. I feel that the laryngocope is not always sufficient to make a diagnosis in certain cases. We know there may be anemia of the larynx as a local manifestation of general anemia. However, when we take into consideration that the anemia of tuberculosis occurs in individuals who have other general symptoms unaccounted for by the general anemia we can frequently, by exclusion, conclude that this anemia points strongly to tuberculosis as the cause. The bacteriologic examination and subsequently the tuberculin test, must be the court of last resort. Concerning the bacteriologic examination in the early stages, we frequently meet with patients who have no expectoration and consequently no way of obtaining, under ordinary conditions, a bacteriologic examination. In these cases I follow the plan of rubbing the larynx freely with plain cotton and smearing this on a cover glass and submitting it to a microspic examination. On one or two occasions I have been able to make a dignosis by finding the bacillus in these rubbings when I could not get it in any other way. Concerning recurrences after an apparent healing of the tubercular ulcers, I do not believe that these are due to inefficient local treatment.

We forget that the same general condition is still operative and in these cases, beside the local treatment, it is essential that a rigid general treatment be adopted if necessary, sending them from the city to the country, or changing their climatic surroundings and compelling complete rest. The treatment with the curette and lactic acid, as pointed out by Dr. Ballenger go hand in hand; the lactic acid should follow the use of the curette, but the use of the curette should be limited to two classes of cases, first, the ulcerative variety, and second, those in which there are soft papillomatous excrescences. In the more firm fibromatous deposit it would be a mistake to use the curette, for I believe it is the use of the curette in these cases and the failure to individualize in its use that have brought this method into disrepute. When we get a good result in one case by its use we are inclined to use it in all cases. I am satisfied the use of the curette is contraindicated in those cases where we have a deposit that is smooth in outline and firm. In such cases we would do absolute harm by opening new avenues for infection. The peculiar interarytenoid swelling needs attention. We do get this in cases of chronic laryngitis but I believe as, Dr. Stein has said, we will find, if we look carefully, not only in inflammatory infiltration but a decided irregular nodular appearance

I have had no personal experience with the method of Finsen, i. e., phototherapy. While Colorado with its remarkable sunshine might offer many advantages it has never appealed to me as worthy of extensive use.

Dr. Beck's case is very interesting. This patient called on me a day or two before I left home. The girl has an extensive involvement of the lungs with evidences of rapidly advancing tuberculosis, as Dr. Beck has said, but no evidence of breaking down. The characteristic appearance in the larynx is that of distinct tuberculoma, extensive interarytenoid swelling. In this case I should not use the curette and lactic acid treatment, but will see if the patient improves in a general way. In her case I do not believe the local treatment is nearly so important as the general treatment, and I do not subject these patients to the extreme distress of a radical surgical procedure until the general condition improves. Then one may consider the advisability of relieving the laryngeal symptoms.

The submucous injections was at one time a favorite method originally suggested by Major. It is of value only in those cases of infiltration where local applications are not followed by improvement. I ceased to use it for the same reason that I would hesitate to open up an unbroken surface. In the use of orthoform I always feel that we have exaggerated the value that is claimed for it. I am not sanguine of its benefits nor am I encouraged by its use alone. In Freudenthal's emulsion probably more is gained from the method than the orthoform as this remedy is a decided analgesic and is certainly an excellent remedy for palliation. Speaking of the palliative treatment in the extensive cases and the use of chromic acid and lactic acid I have found the pain is often relieved by lactic acid or any remedy which would destroy the nerve ending. One of the principal causes of the exquisite sensitiveness of these ulcerations was first shown by Dauzac, who made a good many histologic examinations of these tubercular ulcerations and found there were small neuromata at the ends of the exposed nerves which, acting much like corns, pressed on the ends of the nerves and increased the tenderness over and above that of the simple exposed nerve. I believe there are spontaneous cures, but they are exceptional. Many cases get well before and after treatment and we should endeavor to discover, if possible, what process Nature adopts to bring about these spontaneous cures, when we have once solved this we will overcome many of the difficulties now in our way. The point which I wished to make in the paper was the necessity of individualizing, the necessity of studying each case, and each stage of each case, and applying a remedy for that condition.

Dr. O. J. Stein, Chicago, read a paper:

Leucoplakia Buccalis; a Case Treated with the X-Ray.*

Dr. Joseph Beck, Chicago, read a paper:

Pharyngo-Mycosis Leptothrica or Hyperkeratosis Pharyngis.†

Dr. Robert Levy: We are certainly indebted to Dr. Stein for calling attention to this new agent in the treatment of leucoplakia. One of Colorado's most prominent men, has been afflicted with leucoplakia for many years. In this case the cause is excessive smoking and while the small, milk-white deposits did not disappear, the great mass of heavy deposit did disappear upon discontinuing the use of tobacco. Butlin, in his book on the tongue, gives a better insight into the differentiation of these various conditions of leucoplakia, hornified mucous membrane and allied conditions than anything I have ever seen. Did I gather from the paper that the author is satisfied to continue the treatment? In line with the authorities I have read, I have hesitated to adopt any measure that might in the slightest degree act as an irritant, bearing in mind the fact that this condition may exist for many years without producing serious consequence while surgical intervention, the cautery, etc., might encourage development of a malignant affection.

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*See page 183.

†See page 215.

I did not gather from the paper that Dr. Beck had determined any cause for the trouble and would be glad to know what he considers the cause. I have seen quite a few cases of mycosis, the youngest in a child of six years the oldest in a man between 50 and 60 years. These two cases might be taken as types. Both extensively involved the parts from the naso-pharynx down the lateral wall to the base of the tongue and both responded readily to the treatment by galvanic cautery except for the time required to complete cure. There has been complete and permanent relief up to the present time. Dr. Black of Denver has mentioned a case or two cured by smoking. In the case of the elderly man mentioned above, smoking could have been of no avail as he was a heavy smoker at the time the trouble appeared.

Dr. Holmes: I recall a case of leucoplakia for which various forms of treatment were tried, but without benefit—in fact, treatment seemed to irritate the condition. The patient had an atrophy of the optic nerve in the right eye which was found to be of syphilitic origin. He was a heavy smoker, which however in no way influenced the affection.

I have seen between half and one dozen cases of mycosis, and have invariably destroyed all the points with the galvanic cautery, without recurrence. In one case salicylic acid was advised, but that was so painful that the patient objected, and the galvanic cautery substituted.

Last winter I felt a scratching in my own throat which I attributed to a foreign substance. There was no sharp pain, but still it annoyed me so, that one day I asked my first assistant to look into my throat. He did so, and found numerous white spots scattered over the base of the tongue and on the tonsils, being a typical case of pharyngo-mycosis. One of these masses was removed, requiring considerable force and causing bleeding of the crypt. Treatment with galvano-cautery advised but not carried out, as I was obliged to go east in a few days upon my vacation. With rest and outdoor life the symptoms disappeared, and upon my return examination revealed that every one of the spots had disappeared.

Dr. Pierce: I would like to know whether the X-ray was thrown on the diseased area through the external parts or directly into the mouth.

Dr. Stein: I had tubes 6 inches long and the rays were applied directly on the membrane.

Dr. Stucky: For some reason or other I see a good many cases of myosis in Kentucky. I have tried the galvanocautery and other methods, but never found anything to equal the method suggested in the New York meeting of the American Laryngological, Rhinological and Otological Society several years ago, that is applying a 5 to 20 per cent. solution of pyoktanin. That has given me better results than anything else. It is practically painless and I could teach the patient to apply it himself and report once a week. It usually takes several weeks to get rid of them. There is no reaction like that following the galvanic cautery and other destructive agents.

Dr. Ballenger: I have seen the case of leucoplakia reported by Dr. Stein. I saw the patient when first under observation and, again, this week. I have been very much interested to note the change that has taken place while under treatment by the X-ray—a change seemingly for the worse, as Dr. Stein reported.

In regard to Dr. Beck's paper, I wish to refer to a young lady of 23 years of age, who had been studying voice culture in Berlin and, while there, she noticed a scratching in her throat, and she consulted B. Frankel. She became discouraged and came home. She consulted me, in Chicago, and I resorted to the galvanio-cautery treatment, and at the end of nine sittings there were no signs of mycosis on the tonsils or pillars. This was about 18 months ago. I saw her a few months ago, and the throat was still perfectly clear. I was interested to hear Dr. Stucky's statement of results with other and less severe remedies.

Dr. H. W. Loeb: I was in hopes that Dr. Stein's paper would be a favorable report on the use of the X-ray in leucoplakia. My enthusiasm has been increased in connection with the use of the X-ray by a case, treated by Dr. Pusey, of cancer, in which nearly one-half of the nose was apparently beyond relief, and in which a complete cure resulted. Personally, I know little of leucoplakia, but think I must have had more than my share of mycosis, judging from the few cases reported in literature. I was told, in one case, by a prominent laryngologist that I had probably made a mistake in diagnosis, but now I am sure I did not. The cases, thirty in number, have been really mycosis of the type described. I made one observation, which I mentioned before the American Medical Association some years ago—that is: I have never seen a case in which the lingual tonsil was not also involved. My treatment has been invariably with the electrocautery. The reaction is not bad, and the results are very satisfactory, so that I have had no reason to use anything else. I simply destroy the mass and the seat from which it grows, and I have seen but few recurrences. I can confirm the observation that the disease may exist and the patient not be conscious of it. In the last few weeks a case came to me which had been treated for follicular tonsillitis. Anyone accustomed to seeing these cases cannot make a mistake.

Dr. Stein: I will say that leucoplakia may exist for many years without being a serious condition or becoming malignant.

The pertinent remarks of Dr. Beck on pharyngeal mycoses were very interisting. I do not think there should be any difficulty in the differential diagnosis. Leucoplakia buccalis where the white flakes are found, may exist for many years without producing practically any disturbance, but the fact is recognized that leucoplakia buccalis has a tendency to ultimately terminate in malignancy. Answering Dr. Levy's question as to the appearance of the case and the effects of the X-ray, I will say the case now seems far more serious than it did before the application of the X-rays. I tried to make this clear in the description. Whether this is due to the X-ray or not I don't know. I believe leucoplakia is due to a greater or less extent to a predisposing cause in a sensitive mucous membrane, and of course such an irritant as the X-ray being brought to bear upon a sensitive mucous membrane it might be a cause for its aggravation. As to the direct cause I have not been able to determine. The patient denies syphilis has not been a drinker or smoker for over 25 years; he did chew tobacco but stopped that. His teeth were in bad condition and and being a laboring man probably they were not well cared for.

This model in paper shows the apparatus used by Dr. Pusey. There is no burning, the patient experiencing nothing. Without going into the effects of the X-ray upon the tissues, it is sufficient to say that they have no bactericidal action.

Dr. Beck: I feel that the discussion of my paper did not bring out any point as to the etiologic factors of the trouble and give a clew to the treatment.

The use of salicylic acid is not painful. The pyoktanin is a nice thing particularly for diagnostic purpose as it colors this hornified epthelium; it has no particular therapeautic value.

Dr. Beck referred to a case in a young woman. These cases were in women; most of them occur in women though we do not see them in men usually between the ages of 20 and 30. It is wrong to suppose that the longer a case lasts the more difficult it is to remove the mass. They become softer and can be easily brushed off. The epipharynx is reported affected in very few cases. Campbell of Chicago reports two cases in brothers. Two physicians in France took masses from patients suffering with pharyngeal mycosis and implanted them in their throats (tonsils) but they did not develop which proves that the leptothnix is not the etiologic factor, and that it is not an infection communicated from one person to another.

Dr. Stucky: Have you observed that most of the cases of mycosis occur in people living in the country and who are around cows a good deal?

Dr. Beck: I have found it occur in the better class of people. The two clinical cases were in the better class of people.

Dr. Ballenger read a paper,

The Etiology of Deformities and Deviations of the Nasal Septum.*

Dr. M. A. Goldstein: The point in the question of the etiology of septum deformities is that a series of investigators will take a large number of skulls and study them carefully and each investigator will arrive at a different conclusion, one claiming that a malformation of the bone or an unusually high arched palate is mainly responsible for septal irregularities. Others believe, and this seems to me the more rational, that there is a lack of proper bone approximation in the median line in fetal life. To us who see the cases clinically it is well known that the nares are irregular—we rarely find a straight septum,—but the difference from the normal nose is so slight that it doesn't amount to more than having a right arm or leg naturally a little longer than the left.

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*See page 190.

I believe the main cause of septal deformaties is the traumatic one. I have come to that conclusion from the clinical history of cases where septal deformities required attention. In the majority of cases, after all is said, the traumatic feature is paramount.

Dr. Pierce: At the risk of being premature and perhaps without being able to convince in the absence of photograph which I have in my possession, I shall speak of what I believe to be a very potent factor in deflection of the septum and which might be called straightening of the angle between the sphenoid bone and the cervical vertebræ. At birth a line drawn through the sphenoid and a line drawn through the cervical vertebræ will bear a certain relation.

At six months of age the relative angles would be changed.

Toward the end of eighteen months the angle is still further changed.

If the vomer grows and the straining of the spheno–vertebral angle is not normally coordinate you can readily see how the septum must bend.

In some twenty-five cases I have seen undoubted evidence at a very early age of this deflection beginning. I want to go on record now as the originator of that idea which of course must be worked out and which I shall make the subject of a paper at no distant date.

Dr. Stein: I think it was Disse who originated the theory of embryonal origin of deflected septum. This theory was quoted by Freeman in his paper before the Laryngological Association last summer. He says the palate in the eighth month before birth is above the eustachian tube, at birth it is on a level with the tube and after birth is below the tube. This shows the gradual descent. That has been accepted by some as bringing out the high arched or gothic palate. Dr. Talbott has nicely handled the subject by claiming there is no such thing as a high arched palate, but that it is regulated by a peculiar development, non-development, under-development or over-development of the bones around the palate. This brings us down to Broca's theory on heredity. We get a lot of theories and now we have the Pierce theory which is, however, a very good thought. Speaking of the ethnologic theory, we know the points of development of the septum at different stages of embryonal life. The perpendicular plate is the last to ossify and it is claimed that the perpendicular plate if it overdevelops in ossification characterizes the individual with a peculiar shaped nose; over development produces the Roman nose, underdevelopment shortens it, so that in the new born child where the bridge of the nose is flat it would indicate an underdevelopment until the end of the 6th year, when they are about fully ossified and we get the normal shape of the nose. This might explain some of the cases of deflected septum.

Dr. M. A. Goldstein: I believe we sometimes reach the stage where we are inclined to be too scientific—too much theory, and too little practical. One of the factors mentioned was the frequency of the high arched palate, occurring where there is a decidedly straight septum. That, to me, would appear to disprove the many theories advanced that a high arched palate necessarily forces up the floor of the nose and the septum must find room for expansion laterally. The occurrence of a high arched palate in conjunction with a straight septum is frequent.

Dr. H. W. Loeb: I will make one or two observations confirming Dr. Goldstein's remarks relative to a fairly straight septum where thepalate has a high arch—in fact, I think we rather look for this condition. I am more inclined to view the matter as an overgrowth of the septum itself rather than as due to any arching of the palate. I have had an opportunity for studying the effect of traumatism upon deflection of the septum. I examined a young boy who had received a severe blow on the nose which resulted in separation of the two nasal bones and a slit-like fracture of the septum. Before the accident the septum was slightly inclined to the left side and after the fracture there was a slight deflection to the other side. I am keeping him under observation and shall be able to tell in a year or so whether this traumatism had any influence in causing a deflection to the right side. We often see cases after a traumatism but not having seen them before the traumatism the observations are problematical. If traumatism is the cause why does it not always result so? Everybody gets hit on the nose at some time or other.

Dr. Beck: Do you think the position of children when sleeping lying on their faces would have any influence as a factor in producing a deviation of the septum?

Dr. Ballenger: Dr. Goldstein seems to sustain the Bosworth theory of the traumatic origin of most cases of deflected septum. I do not deny that most cases are perhaps of traumatic origin, but, as Dr. Loeb has observed, while we may get a history of traumatism, because a child has received a blow on the nose it does not necessarilly follow that the deflection is always of traumatic origin. Dr. Goldstein's remark concerning the septum and a high arched palate seem to be unwarranted by the facts as observations have shown that there is an apparent high arch but it does not actually measure higher than the ordinary arch.

Dr. H. W. Loeb; Presentation of Patient,

Eunuchoid Voice in a Female.

This patient, a girl aet. 18, came to me a year ago. She had noticed some trouble with her voice but otherwise was healthy. When I examined her larynx I was surprised to see how large it was. I had occasion to compare it with the larynx of a German woman 5 ft. 11 inches high. In the girl are diameters were greater than in the woman. I sent her to a gynecologist with the statement that he would probably find her to be a hermaphrodite. He found a clitoris five times the normal size otherwise the genital organs were normal. She has no menstrnal disorder. Her voice is of that type known as eunuchoid, found so often in boys at or first after the period of puberty.

Dr. W. B. Shields, St. Louis, read a paper,

The Frequency of Ethmoiditis in So-Called Nasal Catarrh.*

Dr. C. R. Holmes: Did I understand the Doctor to say that he does not believe in differentiating between the anterior and posterior cells?

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*See page 209.

Dr. Shields: The middle cells—not the posterior cells.

Dr. Holmes: I agree with the essayist that we are apt to overlook a disease of the ethmoid. I am quite confident that I have in the past, but now I search more faithfully. I do not think transillumination has any value in ethmoid disease, but the transillumination of the antrum of Highmore is of the greatest importance. If we obtain a distinct reflex from the pupil (and in doubtful cases the pupil should be dilated) then we may as a rule say that the antrum is not involved.

Dr. Stucky: I quite agree with the essayist that this trouble, ethmoiditis, is more common than is generally sufposed. I believe too, that it is increasing in frequency and the probable cause is the grip which is sweeping over this country. One peculiarity about these cases is beside the temperature mentioned by the essayist, the pain and discomfort about the head. This is out of all proportion to the other constitutional symptoms. The pulse is not greatly accelerated and the temperature is not high, but I have repeatedly noticed this headache—a pain between the eyes of a nagging, indescribable character, which is only relieved by cleansing the nasal cavities and giving free drainage. In these cases removal of the tip of the swollen turbinate gives almost magic relief. I do this frequently—whenever there is any pressure. I believe the essayist is correct too, when he says that the suppuration in chronic ethmoiditis drains down into the antrum and frequently infects it, and that the antral trouble is secondary.

Dr. M. A. Goldstein: The free use of adrenalin chlorid 1 to 1000 has made the treatment of these cases of ethmoiditis much more simple. I have observed in this class of grip inflammations mentioned by Dr. Stucky an almost universal congestion of the mucosa of the nasal and accessory sinuses and I use adrenalin chlorid freely. This application is sometimes sufficient to abort acute cases.

Dr. Stucky: Do you use it in full strength?

Dr. Goldstein: 1-1000. I have never seen any adverse results from its use in this strength.

Dr. Levy: I take it that the essayist had in mind a consideration of ethmoiditis in the chronic stage more than the acute, and that Dr. Goldstein and Dr. Stucky referred more so the acute conditions. There is a great difference in the manifiestations of the two and also in the therapy. The management of the acute conditions is comparatively simple and satisfactory compared with the management of the chronic, and I believe the paper had for its object the calling our attention to the frequent complications of ethmoiditis and the importance of differentiating between the involvement of the anterior, middle and posterior cells, and determining the line of treatment and prognosis. Where the anterior cells alone are involved the treatment is followed usually by good results, but the reverse is true I believe, where the posterior cells are involved. Here we have to deal with complications involving the frontal sinuses and the maxillary antrum. The acute pain mentioned by Dr. Stucky I have always thought neuralgic in character. It is intense from the congestion of the mucous lining of the cells and a consequent hypersensitiveness. Beside adrenalin, not as strong as Dr. Golstein uses it, and hot boric acid washes, I have found invaluable aid in the administration of some antineuralgic remedy internally.

Dr. Pierce: Undoubtedly an inflammation of the anterior and middle cells, they being really the same group, and inflammation of the posterior cells emptying into the superior meatus, have an entirely different signification as regards treatment, diagnosis and prognosis. Inflammation of the posterior cells is rather rare but inflammation of the anterior cells is somewhat frequent, both acute and chronic. The symptoms of inflammation of the anterior cells are pain over the supraorbital region, tenderness on deep pressure into or near the upper portion of the orbit, with a discharge into the middle meatus. In the examination I invaribly use adrenalin solution, 1-1000, on a swab, then the nose is thoroughly cleaned and a search for the discharge is made. A discharge from the anterior ethmoidal cells usually comes out over the head of the middie turbinate or along the anterior third. This is an important point. Discharge from the maxillary antrum tends to pass over the middle third of the inferior turbinated body. The article that has given me the most satisfaction in the treatment of acute inflammations is a powder composed of one part antipyrin, two parts sugar of milk and one part cocain. This is blown with considerable force into the anterior portion of middle meatus. The relief of supraorbital pain and nasal engorgment has been surprising and will last from several hours to a day.

In the differentiation between ethmoid disease and disease of the antrum of Highmore I place as much dependence on Fraenkel's position as I do on transillumination, and I think the subjective sensation light in the eye is as important as pupillary reflex. In chronic suppurations I have had a few cases where I have taken away the tubercle of the septum, removed the anterior head of the middle turbinate body, and scraped out the lateral wall and yet the suppuration has gone on. I believe in a great many of these cases it takes a deal of courage to get at the seat of the trouble and yet without doing so we may be unsuccessful in the treatment of a great number of these cases of anterior ethmoidal disease. In the scoops as constructed by Grunwald we have very effective instruments for treating them. In two cases I have had inflammation of the orbit cellular tissue resulting with alarming symptoms but both subsided without permanent injury. In one of these cases the discharge continued.

Dr. Stein: Personally I like to make a distinction between anterior, middle and posterior cells because I think it influences the prognosis and treatment. In the treatment I often adopt the method of Bosworth by going to the seat of the disease. When I heard Bosworth make the statement that he introduced a burr into the nose without a speculum, standing at the side of the patient, turning on the current and allowing the burr to go wherever the hand dictated, I was thouroughly astonished. I could not imagine any one having the courage to do that. After trying a great many other means in some desperate cases, I used the burr under the guidance of the eye and with a speculum, but I finally discarded the speculum because the hand was in the way, and so worked without the speculum seated in front of the patient. I did this in several cases, but it takes a lot of courage. The burr seems to lessen the amount of hemorrhage by the way it tears the tissues.

Dr. Holmes: I want to protest against that kind of operating. While there may be men who can do it, it is dangerous to advocate it. Dr. Stein and Dr. Bosworth may be able to do it but if we advocate this method I am sure that somebody will sign death certificates as a result. I have dissected about 400 heads, and have cut them in all directions, and have come to the conclusion that on account of the great variation in shape, size, etc., this method of operating is exceedingly dangerous, to say the least.

Dr. Pierce: What advantage is it to stand at the side of the patient and hold the burr without looking through the speculum?

Dr. Stein: There is no particular advantage in using a speculum because the hand gets in the way. The hand piece to my electric engine and the burr I use are short and hence I feel safer without the use of a speculum because I have perfect control of my instrmment. I agree with Dr. Holmes. I am not advocating the method—I simply state what I have done. I mention it because I had good results and coming from such an authority as Bosworth I thought it worth while to speak of it.

Dr. H. W. Loeb: The matter of chronic ethmoiditis, to which the essayist in the main referred, concerns us often, especially in the anterior portion of the cells. In ethmoiditis with suppuration we frequently get good results by permitting drainage to go on as in any other closed cavity; therefore I do not think it is always necessary to subject the patient to the risk of such an operation as Dr. Stein mentioned.

Dr. Shields: I agree with Dr. Holmes and think that transillumination is rather a dubious means of making a diagnosis, but I have seen cases of immense enlargement of the middle turbinate and a somewhat thickened condition of the bone in which transillumination seemed to assist in making a diagnosis. I have found it hard to penetrate the bone in these cases. I have had several cases in which I could find no trace of pus, but the pain and pressure and high temperature indicated retention of purulent matter, and these cases were very puzzling to me and caused me great anxiety for fear of penetrating the cranial cavity in searching for pus. I find the suprarenal capsule an excellent remedy, but I use the powder—about 20 per cent. in water. I apply it on tampons of cotton and the patients complain little of irritation. I have used the adrenalin chlorid also, but in the strength of 1 to 4000 or 1 to 5000 as a spray for home treatment. The paper was meant to deal with chronic ethmoiditis—nothing was said of acute cases. By chronic catarrhal conditions I mean those cases in which we have no elevation of temperature and a good deal of pain but find little pus, but there is bound to be some pus because most of these cases are infectious. The diagnosis of these cases is often difficult and it sometimes takes an immense amount of courage and more perseverance to obtain a cure. I do not believe in the radical operation by Mr. Lack, of London. From the description of the operation in chronic cases he takes out all the upper external wall of the nose. I should be afraid to do an operation in that region in such a radical manner?

Dr. Holmes: Operating through the nose?

Dr. Shields: Yes. He takes away the middle turbinate and scrapes out all the anterior, middle and posterior cells. In the Laryngoscope of November, 1901, is given a discussion in the Laryngological Society of London and many of those who discussed this operation disagreed with the operator. I do not think the risk of the operation is justifiable. I have seen Dundas Grant use hand burrs in the ethmoidal operation telling by the sense of touch when he is in the cells, when he touches the orbital plate and the different parts. I have never used the burrs. I have recently used Holmes's scissors and found this instrument very satisfactory in taking away the anterior portion of the middle turbinate.

Dr. Holmes: You spoke of a 20 per cent. solution of the suprarenal capsule. It is claimed that you cannot get a solution of that strength—that you cannot get a solution stronger than 10 per cent.

Dr. Shields: I have read that also.

Dr. M. A. Goldstein, St. Louis, read a paper,

Ear Complications and Sequelae of Influenza. (Abstract.)

Over 70 per cent. of all acute inflammatory affection of the middle ear cavity result from previous affection or infections of the pharynx or naso-pharynx. It is in influenza, especially of the epidemic type, which usually attacks the nasal and post nasal areas suddenly and viciously, that the most rapid involvement of the ear ensues.

The symptoms are more severe than those of simple catarrhal otitis; there is sudden, intense deep seated pain, involving much of the temporal region, with rapid tenderness over the mastoid area and profuse serous effusion into the tympanic cavity, vertigo and persistent hemicrania.

Pre-eminent among all measures for the relief of acute inflammation of the middle ear cavity, especially where serous, bloody or purulent effusions has taken place, is paracentesis. Until recently the indications for paracentesis in such conditions has been that of a bulging membrana tympani. The author goes one step further in this direction and urges the free and early incision of the drum membrane as soon as a diagnosis of "grippe ear" has been established. He does not wait for the results of applications, either hot or cold, but establishes a drain from the middle ear cavity at the outset. If the drum membrane is bulging as a result of effusion in the tympanic cavity, the more promptly we evacuate the contents of this cavity the better; if the drum membrane is retracted producing an interference of air equalization from within and consequent pain, the paracentesis re-establishes this air balance. In either case, free incision of the drum membrane is the first principle to be observed.

To promote drainage after paracentisis or spontaneous perforation he uses the one-half inch selvedge gauze strip, either sterilized, carbolated or iodoform, packing the canal from fundus to meatus, and renewing the dressing whenever wet or saturated.

The fauces and naso-pharynx should be frequently cleansed, and the patient should be given constitutional treatment.

To recapitulate, the main points of value in the condutc of influenza otitis:

1. Epidemic or endemic influenza is the etiologic factor in this affection.

2. A careful differentiation should be made between simple otitis media and influenza otitis.

3. Free incision of the drum membrane at the earliest indication of effusion into the tympanic cavity should be made. This free drainage should constitute the most important princlple in the treatment of this affection.

4. A guarded prognosis should be given, especially as concerns the complete restoration of hearing.

5. Conservatism is urged concerning operative interference when mastoid symptoms appear, as many of these symptoms are accompaniments of influenza and should be regarded as neuralgias rather than evidences of suppuration.

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XXX.

THE PRESENT STATUS OF THE KNOWLEDGE OF OTOGENOUS PYEMIA.*

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Differences of opinion on some of the problems of otogenous pyemia still exist, notwithstanding the great increase in the number of cases and detailed reports in the last few years. The unsettled problems are of great practical importance and are proper subjects for discussion. It appears, however, that opposing views are diminishing; it would be a source of gratification if the present discussion should help to bring about a greater unanimity of opinion.

Let us quickly pass over the facts, which through the splendid labors and investigations of Koerner, Zaufal, Leutert and v. Bergmann have received general acceptance. It is unnecessary to enter into the difficulties, which may obscure a diagnosis, when the fever is entirely absent, or is high and continuous, or when cerebral symptoms are only apparent; nor is it unnecessary to call attention to the frequently benign character of otitic pyemia nor to the rare cases of rapid and fatal blood infection nor to the fact that the generally fatal prognosis of former times has become relatively favorable by the energetic opening of all infected foci.

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*Read before the 10th Congress of the "Deutsche Otologische Gesellschaft," Breslau. May 24th and 25th, 1901.

The question of causation, and the basis upon which otogenous pyemia arises, deserves great deliberation, because the answer to these problems furnish valuable indications for treatment of this disease. Upon the post mortem table we become most familiar with the obturating and more or less septic and disintegrated thrombus. Reports are accumulating of small thrombi lining the vessel walls, causing pyemia; we also meet with thrombosis of recent origin producing little or no infection; with softened thrombi of this variety from which it is frequently impossible to raise cultures. Extradural abscesses of immense size contiguous to the sinus force, at times, the conviction that pressure of these enormous accumulations of pus and granulations have compressed and obstructed the sinus and produced a thrombosis by purely mechanical means without infection and without the possibility of a subsequent pyemia.

We must attempt to find a solution to the question, if a periphlebitic process can pave the way for resorption into the body of poisonous and pyogenic substances, be they cocci or toxins, when the endothelium is intact or affected with such insignificant lesions as to permit a prompt restitution after the removal of the purulent focus next to the sinus, and whether or not extradural abscesses contiguous to the sinus may not alone produce pyemic fever without metastases, which promptly and completely subside after their evacuation. Wide differences of opinion finally exist as to the extent, manner and characteristic symptoms, produced by pyogenic substances taken up by the body, from the bone of the mastoid process or from cavity of the middle ear.

The importance of abscess formation along the sinus and of inflammatory processes along the walls of the vein is admitted. Practically we have to deal only with the sinus transversus, mostly within the sulcus sigmoideus and jugular bulb; rarely with the superior petrosal sinus.

The exterior wall of the sinus is thin and consists only of the exterior layer of the dura. A septic and infectious process along the sinus exerts an adverse influence with far greater facility upon the endothelium and the contents of the sinus than a similar process could produce upon the cerebral portions of the dura through its entire thickness. These differing conditions are very apparent. The immediate influence of an extradural abscess is confined to the exterior layer of the dura and no fever exists. In gangrenous conditions we often find to our astonishment on post-mortem examination the inner layer of the dura intact and protecting the brain, although we expected to find a disintegration and necrosis of the entire dura. In periphlebitis, however, we find the infiltration of the external layer bringing the infectious focus at once into direct proximity with the endothelium, frequently causing gangrenous inflammation of the external sinus wall.

In periphlebitis, especially where large enclosed abscesses exist, lymphatic connection with the interior surface of the veins is formed. In phlebitis, where the entire wall of the vein is inflamed, the contact with the septic substances is even more direct and immediate and productive of lesions of the endothelium and frequently of a thrombus lining the wall. We have here by direct resorption an immediate ingress of toxins or cocci into the blood. The frequent appearance of fever, when a perisinuous abscess exists, seems therefore in entire harmony with the nature of the affection.

The fever is of pyemic character as a rule, not accompanied by metastases. A minimal periphlebitis, appearing as a slight thickening of the wall or as a barely noticeable discoloration or as a velvety layer of the minutest granulations, may according to its degree of virulency produce grave pyemic conditions, while an immense extradural abscess may be almost or entirely unaccompanied by high temperatures. The fever usually subsides immediately after laying bare and thoroughly cleansing the perisinuous focus.

The endothelium is lost when subjected to prolonged inflammation or to high virulence of septic material; small deposits are formed and a wall-lining thrombus is produced; grave pyemia and embolic metastases now readily occur. The wall-lining thrombus developes into an obturating thrombus and establishes an occlusion of this vein and for a time its elimination from the circulatory system, and in this way there is frequently a temporary subsidence of the pyemic symptoms. The wall-lining thrombus may subside, if the supply of infectious material ceases either by spontaneous cure of the proximate infectious focus or by thorough exposure of the diseased sinus.

A solid thrombus, if only moderately infectious, can and as a rule does subside after early exposure of the perisinuous focus. The pyemic fever ceases at times quickly, at times somewhat slowly, the spread of metastases ends and those already deposited are overcome more or less quickly and successfully by the natural recuperative forces of the body.

The thrombosis caused mechanically, by compression of the sinus, followed by coagulation of its contents, will always remain free of infection, if the nearby infectious focus be early removed. It is a mistake to operate on this kind of a thrombus, as even the use of the exploratory needle may convey the infection.

All of these considerations are applicable when the disease affects the jugular bulb. The primary infection of the jugular bulb is quite rare, considering its direct proximity to the middle ear. This peculiarity rests upon the fact that chronic middle ear suppurations lead mainly to pyemia mostly by extension into the mastoid process, where the infectious focus is brought into direct and continuous contact with the sinus. The large class of cholesteatomata especially diverts the infection from the jugular. Acute inflammation of the middle ear, however, often primarily endangers the jugular bulb as we shall see hereafter. In pyemia consequent upon acute middle ear suppuration. phlebitis of the jugular bulb is for this reason of especial importance and needs to be thought of, when the exposed sinus shows no involvement. Infection of the jugular bulb prevails in proportion as the appearance of pyemic symptoms is early in acute middle ear suppuration.

Besides the phlebo-thrombosis—the diseased condition of the sinus wall or sinus—the suppurative process localized within the mastoid has been held accountable for the causation of pyemia in many instances and has been explained by the assumption of an inflammation of the small mastoid veins. The effect of an osteophlebitis in the mastoid process can, however, differ in no way from the suppuration in the bone itself unless the vein be the subject of phlebo-thrombosis at its point of entrance into the sinus. When such is the case, it presents the condition of a wall-lining thrombus of the sinus. Koerner especially has recently described this method of causation of pyemia by ósteophlebitis as a distinct disease, though this condition had for a long time been generally assumed in mild cases. He contrasted it with sinus-phlebitis, mentioned its occurrence as not rare, furnished much literary proof on the subject and held it as easily diagnosed.

In order to judge as objectively as possible upon the basis of real facts the question of spontaneous cure of sinus-thrombosis, I formerly looked upon most of the cured cases of pyemia as arising from the mastoid process alone. The larger the number of cases has grown which have come under my personal observation, the more have I receded from this opinion, a position which has been verified by observation upon the operating table, by the systematic exposure of the sinus in all febrile complications and by use of the exploratory puncture, which has taught us to recognize thickening of the sinus wall by deposit on its inner surface. This opinion has also been strengthened by the discussion by Leutert a few years ago. In my cases of pyemia of this kind, disease of the sinus has always been recognized.

The conditions for resorption seem to be quite unfavorable in the mastoid process, especially so in the sclerosed variety, so frequently found in the aged. This explains the almost regular freedom from fever in uncomplicated suppuration of the mastoid even if the pus be confined under high pressure. Fever in the beginning of acute purulent middle ear inflammation, when it is most liable to exist, is not usually due to suppuration, but to a hyperemia or a serous affection. Temperature from this cause subsides, if free drainage is secured, as a rule, after the first acute stage permanently, except in very small children; mastoid affections, of relatively mild degree, are accompanied at times by a high fever in severe cases of measles or scarlet fever. Grave pyemia with chills and metastatic abscesses however are never caused by a suppuration within the mastoid.

Post mortem observations of Ponfick and Brieger upon the body and the blood prove beyond doubt that in infants and very young children toxins, staphylococci, etc., can be absorbed directly into the blood from the diseased bone of the mastoid or from the suppurating middle ear. This method of absorption disappears gradually with increasing growth and this origin of pyemia has no practical importance in adults. I do not deny the possibility of pyemia of a mild character arising directly from suppurations in the mastoid process, but I seriously doubt its frequency, its significance in practice, and above all the occurrence of metastases in these cases.

It is of interest to inquire how far this method of causation of evident pyemia with metastases is proven in our literature.

If we want to prove the existence or the possibility of existence of a pyemia without any participation of the sinus or jugular bulb by citation of cases, it is necessary to exclude perisinuous abscess or periphlebitic affection; furthermore no noticeable indications of jugular phlebitis should support the suspicion of jugular implication.

The most convincing proof is furnished by such cases in which post mortem examination has thrown clear light upon the question. The examination can only be considered as sufficient when the record of the autopsy not only clearly states the condition of the sinus, but assures us of the examination of the jugular bulb by its specific mention. Even this requisite does not satisfy every claim. A recent publication from Schwartze's clinic proves that wall-lining thrombi in the jugular bulb may escape the observation even of an expert in post mortem examinations and may only be found by minute examination of the removed temporal bone. With these precautions I shall examine the large number of published cases which have been principally collected by Koerner. The entire literature, with exception of the cases reported in the Transactions of the Otological Society were at my disposal.

We must exclude from this consideration without doubt cases in which the autopsy or operation showed thrombosis to have existed in three cases, also cases with perisinuous abscess (six or probably eight cases), together about eleven cases, also the cases with clinical symptoms of jugular phlebitis (four cases); finally cases in which, very shortly after jugular ligation, a septic thrombus formed in the sinus (two cases), as they do not seem especially appropriate to furnish proof against a primary wall-lining thrombus. Of sixty cases reported, 15-17 cases may therefore be excluded as of no value. There can be no question that these 15-17 cases furnish no evidence as to whether or not so-called osteophlebitis can produce pyemia without implication of the sinus. Fifteen of twenty-six operated cases have been insufficiently described or operated upon, and consequently they are not suited to convey information on the question of existing perisinuous abscess or of periphlebitis.

Sixteen cases recovered without operation. In these cases speculation may have free play. It is hardly doubtful, however, that in a debatable question, these cases which themselves need elucidation, can be of no great value as proof. Of the twenty-six operated cases some were without pus in the mastoid; six times the mastoid was found healthy and even sclerotic. The origin of osteophlebitis in these cases is surely an open question.

But the origin of sinus phlebitis may well be questioned in these cases. I have seen very insignificant alterations in the mastoid process without any secretion, productive of evident periphlebitis and leading to grave sinus disease. In some of the reported cases pyemia occurred some time after the operation, in others pyemia was already existing without evident disease of the mastoid. These are manifestations which can not be regarded as self-evident of ostoephlebitis, but they may readily be explained by the assumption of phlebitis of the sinus or jugular bulb. I may not pass without mention of the fact—even if it proves nothing—that I have at times regarded my own cases of this kind as thrombosis of the lateral sinus. In half of the number of cases the autopsy has either been insufficiently made or insufficiently reported. In no case has the examination and condition of the jugular bulb been explicitly stated. The findings have been restricted entirely to the condition of the sinus. Deducting these cases, only a small number remains of the respectable number of sixty reported cases and the remainder does not bear a very critical investigation. It also deserves to be mentioned that 25 per cent. of the cases were caused by a chronic middle ear suppuration, 15 of which (over 25 per cent.) died, 13 times metastatic abscesses occurred in the lungs, several times in the kidneys and spleen and 37 times (3 times as often) in the muscles and joints. Koerner also seems to exclude the cases in which pulmonary metastases occurred. Of 41 acute cases, 32 recovered; of the 16 chronic cases, 10 recovered. As I have already mentioned, I do not absolutely deny the possibility of an osteophlebitic pyemia. It is, however, of great practical value to determine if this kind of a pyemia does occur as frequently as contended by Koerner and other authors. I believe that I have shown that proof, therefore, can not be furnished by the existing literature on the subject. Following the example of Leutert, recent observers have certainly become more skeptical. I recall to you a publication of Eulenstein, who made a diagnosis, of phlebitis, with wall-lining thrombus, in a case which he would formerly have regarded as of the osteophlebitic type. This shows the diminishing danger of arriving at a diagnosis of osteophlebitis in cases of a phlebo-thrombosis, or of being satisfied with opening of the mastoid alone, as Hoffman did years ago in a case of phlebitis, where the necessity for exposing the large vessels exists.

In what relation does the uniform material of my own observation stand to this question? Nine years have passed since my first publication on sinus thrombosis. How has the pyemic process shown itself in my observation during this time? In a number of cases of mastoid disease, fever was present. The operation usually uncovered a perisinuous abscess, and the fever as a rule subsided readily after the operation. Several times it was only subsequently possible to find a thrombus in the previously free sinus. Of 63 cases of pyemia seen and operated upon by myself it was impossible in 3 or 4 instances to find a thrombus of the sinus or jugular; instead more or less intense periphlebitic processes were present. In 2 cases only these were sufficiently insignificant to permit doubt of the probable entry of the infection at this point. In one of the cases the jugular vein also showed no evident inflammatory changes, when it was ligated; the other case recovered without ligation. The gravity of the pyemic symtoms in this case compelled the assumption of a phlebitis or thrombus of the bulb, rather than a healthy state thereof. Only one case remains in which the ligation of the jugular brought about a cure of lasting pyemic symptons without coexisting evident alterations of the sinus or jugular. This was a case of severe infectious scarlatinae otitis, which had produced a necrosis of the bony wall of the sigmoid sinus. The existence of a light periphlebitic process with necrosis of the bone suffices in a case of severe infection to hold the sigmoid sinus responsible, as the focus of eruption of a pyemia without metastases. This case is the only one which could be regarded as osteophlebitic.

When is the diagnosis of osteophlebitis justified? Koerner, whose excellent treatise has often been a pleasurable source of information to all of us, has in the 2d edition, with increased attention interested himself in this affection. He regards the assumption of pyemia as justified when high fever with chilly sensations occur in a case of acute middle ear suppuration without impediment to free drainage. If, in addition to these symptons, metastases occur in the joints, serous cavities or muscles, osteophlebitic pyemia may be diagnosed with great probability. In chronic purulent cases pulmonary metastases point to sinus phlebitis, even without definite symptoms of occlusion of the sinus or jugular. In 20-25 per cent. of the cases collected by Koerner, pulmonary metastases were present, and as many cases had chronic suppurations. We may add that fever with chills is indicative of pyemia in chronic cases as well as in acute, and that fever without metastases should, in chronic cases, permit the assumption of osteophlebitis as the cause of the pyemia with better reason than when metastases are present in the muscles, etc.

To hold the mild or severe course of a disease as indicative of the location of the infectious focus, especially in a disease so variable as septicopyemia, is not permissable. The virulence of the infection is frequently of more influence on the character of the disease than the size of the diseased blood vessel. The existence of sinus thrombosis could not be diagnosed in two of my cases of the last 9 months on account of the absolute lack of febrile manifestation (chronic cases with cerebral symptoms), and in two other cases on account of the minimal temperature (38.2 per cent.). 7 cases of acute middle ear suppuration resulting in recovery showed mild metastases in the muscles and joints; of the chronic cases only one showed this complication. Pyemic fever, without metastases, was observed once only in acute suppurations. These ten cases of my own presented the picture of osteophlebitis as described by Koerner, and three other cases showed even fewer symptoms. In all of these cases a thrombosis of the sinus or jugular vein was demonstrated with certainty by the operation. I could cite even more cases of a prior time. I have observed another case of pyemia without metastases, due to periphlebitis, in which the patent sinus became thrombosed 2 days later.

As opposed to these cases I have observed 3 very grave pyemic cases without demonstrable thrombosis. The first had a severe septicopyemia with numerous metastases in the joints, muscles, eyeball and a severe nephritis. After a long confinement he recovered. We found an inconsiderable periphlebitis with a few drops of pus on the prominent portion of the sinus, which was easily torn and bled severely during the operation; an insignificant amount of inflammation existed in the mastoid process: the jugular vein which, in my opinion was probably diseased, was not investigated. The second case was the patient with scarlet fever otitis, already mentioned. The third case was one of intense pyemia, with a large perisinuous abscess, with a gangrenous and discolored sinus wall of great friability. The tearing of the sinus wall caused a copious bleeding. The jugular was tied four days later and showed no discernible pathologic lesion. An abscess of the lung was evidenced by expectoration on the evening after tying of the jugular. In this case a thrombosis could not be demonstrated, but without doubt sinus disease existed. It is self-evident that a wall-lining thrombus often furnishes more favorable conditions for a severe general infection than an obturating thrombus.

From the considerations presented, we must deduce the conclusion that Koerner has invested the process known as osteophlebitic pyemia with an importance not properly belonging to it. He says: "The pyemia without affection of the sinus seems much rarer than the otitic pyemia with phlebitis of the sinus." I hold that if pyemia without infection of the sinus occurs at all, it is extremely rare and of no practical import. Metastases in the muscles, joints, etc., do not exclude the probability of a diseased sinus, on the contrary, their existence points to a disease of the sinus or bulbus jugularis. We have not been able to confirm the opinion. either by investigating the literature on the subject, or by our own observations, that the course, the kind of metastases, the complications. or prognosis of osteophlebitic pyemia is materially or easily distinguishable from the symptoms produced by pyemia due to sinus phlebitis. A phlebitic process of the sinus can, with due attention, be readily recognized as far as the end of the sigmoidal portion of the sinus. From there to the foramen lacerum it is more difficult, and a periphlebitis of the bulb is outside of the possibility of direct observation. I do not assume that for this reason a periphlebitis of the bulb may be regarded as an improbable affection, or that its existence, as a phase of pyemia, can be denied. The danger to the jugular bulb in the beginning of an acute middle ear suppuration, due to a virulent and severe infection is enormously greater than to the more distant lateral sinus. This corresponds to the anatomic conditions, which are especially favorable in acute purulent middle ear inflammations, to cause a spread of the disease to the jugular bulb. A contamination of the adjacent bulb is favored by high virulency of the infection, by delay in spontaneous rupture of the drum and by favorable anatomic conditions, such as a high-reaching jugular fossa, an extensive surface of opposition of the jugular fossa and bulb, and by dehiscences.

In a case of severe sepsis, due to acute grippal middle ear inflammation, a purulently decomposed thrombus of the upper portion of the jugular was found on the 7th day after the appearance of fever.

This shows how quickly septic decomposition of thrombus of the bulb also may occur. It is quite possible that an extensive distribution of septic material through the body may be derived from a wall-lining thrombus before the jugular bulb has become obliterated, and that the patient may succumb, even if the jugular vein be ligated. I regard all phlebitic processes in the jugular bulb as of greater importance in the production of general systemic infection than the analogous processes in the transverse sinus. It seems, however, that the conditions for spontaneous cure of periphlebitis are relatively favorable near the bulb. provided that the infection be not of extreme virulency.

For the production of pyemia the lateral sinus needs the influence of a long persisting retention and of an increasing severity of the disease external to the sinus. Near the bulb we have a reversal of these conditions. Either a spontaneous rupture of the drum occurs or the pressure on the middle ear is relieved by paracentesis. The height of the inflammatory process soon passes after this procedure. The infectious supply and pressure on the bulb cease. The periphlebitis, the disease of the vessel wall, can now recede, and the wall-lining thrombus does not enlarge or renew, inasmuch as the infection has been withdrawn. If a virulent infection has not yet produced a severe local or general infection, restitution may even take place. When the sinus shows no diseased alterations in cases of mild or severe pyemia, we must consider the probability of a bulbar phlebitis, especially in cases of acute otitis.

In my material, acute otitis is in excess (16:11). The relative preponderance of primary bulbar phlebitis is not surprising and is. without doubt, the cause of several cases of pyemia, inclusive of 2 fatal cases (Schiller, Bohne).

Consensus of opinion exists in the treatment of otitic pyemia, as to the necessity of eliminating the septic decomposed thrombus from the circulatory system. To what extent the ligation of the jugular vein is necessary, desirable or superfluous, is still under discussion. In the treatment of the wall-lining thrombus no unity of opinion prevails.

All agree to the necessity for operative interference in every case of pyemia, regardless of the spontaneous recoveries from pyemia which are recorded. Our end in view must not be the exposure of the pus accumulation in the mastoid, but at the very least the inspection of the sinus. A number of cases of mild pyemia are cured by the removal of the pus focus adjacent to the sinus.

This procedure is insufficient, if a progressive septic thrombus exist within the sinus. A septic decomposed thrombus must be rendered innocuous by opening and eliminating the diseased bloodvessel. To do this we must consider either the incision of the sinus or the ligation and emptying of the jugular or both operations together.

Less precise are the indications when we meet an inflammation of the vessel wall, or a wall-lining thrombus, or when we are in doubt about the exact nature of the existing disease. Compilations show that the ligation of the jugular in pyemia is followed by better results than the operation on the sinus without ligation of the jugular. Of 94 cases, in which no primary indication of jugular disease existed, 40 were operated, according to Viereck's compilation, with ligation of the jugular and 54 without. Of the 40 ligations, 6 (15 per cent.) died and of the 34 cured cases 6 had metastases. Of the 54 cases operated upon without ligation, 13 (24 per cent.) died and of the 41 cured cases, 16 continued to have pyemic fever and 2 had metastases. Viereck advocates the ligation of the jugular in all cases and like Zaufal, Voss, Dalgren, Knapp, Broca demands the ligation before operating on the sinus. Koerner holds the ligation in all cases as justified and v. Bergmann mentions in his textbook ligation as a recommendable part of the operation, after speaking at the congress of surgeons in 1895, absolutely in favor of ligation before operating on the sinus. Hessler does not advocate ligation in all cases. Brieger considers the prophylactic ligation of the jugular as superfluous and even dangerous. Leutert advocates ligation mostly after opening of the sinus and with certain restrictions. MacEwen, who some years ago reported 20 recoveries out of 28 cases operated upon and who attained the greatest number of recoveries, seems to have operated on the sinus alone, even in cases with clinical symptoms of jugular involvement. It can not be stated from his writings that he is opposed to ligation of the jugular. It is to be regretted that MacEwen has not published his entire material. His book contains only 4 cases of inconsiderable interest. Some authors demand the ligation of the jugular in every case, others do not insist on it as a matter of necessity in every case, but are generally in its favor, still others hold in certain conditions the jugular ligation as superfluous, some even as dangerous. There seem to be no absolute opponents to jugular ligation in all cases. It is unnecessary to insist before this body that the ligation of the jugular as the first step of the operation is necessary in all cases in which jugular implication is established. These cases are not frequent. The indication for ligation of the jugular as first step of the operation may even be extended to include all cases of sepsis or extremely severe pyemia with frequent chills, bad general condition and all cases having metastatic abscesses. In all other cases the opening of the mastoid antrum or the radical operation is followed by baring the sinus, Should the incised sinus give exit to a liberal quantity of decomposed fluid, it may be assumed that the septic process has either progressed to the jugular bulb or continually threatens to infect the bulb. The jugular vein should under these conditions be at once ligated. Should the decomposed septic material extend to the periphery and a solid red thrombus fill up the space toward the jugular, we should limit the operation to the sinus alone. In these cases the ligation of the jugular is mostly superfluous. A septic fetid pus focus is of greater danger than an accumulation of creamy pus. In the former the ligation of the jugular may need earlier consideration than in the latter condition. Former statements of mine in regard to jugular ligation have been repeatedly misunderstood. In calling attention to the fact that under certain conditions the ligation of the jugular endangers the inferior petrosal sinus, I desired by no means to put myself absolutely in opposition to ligation of the jugular. If we find in the sinus a still solid thrombus, or a small septic focus, or a pus focus consisting of inoffensive creamy pus, which does not reach near the bulb, the opening of the sinus to the point, where it is occluded by a healthy, not discolored thrombus, and the excision of the wall usually suffice. Success seems to be the more assured the further back the decomposed thrombus is located. It is necessary to expose the sinus toward the periphery for several centimeters to its healthy portion and proceed until fresh, red thrombus is reached. It is good practice to remove this thrombus with a sharp spoon to the extent of free venous bleeding. It is, however, unnecessary to proceed this far in every case. Frequent changes of dressing, daily or on alternate days are of advantage. To find a septic thrombus reaching beyond the torcular Herophyli is rare, when a timely operation has been performed.

What should be our method of procedure in cases where we find the sinus filled with fluid blood? The question presents itself whether we have before us a perfectly healthy sinus or a wall-lining thrombus. When we have exposed a periphlebitic focus we are justified in stopping the operation and awaiting the result, if no grave pyemic symptoms be present. Some authors demand even in these cases the prompt opening of the sinus, but it seems to me without sufficient reason. When a wall-lining thrombus can be demonstrated, the general condition of the patient and the character of the pyemia must decide our further procedures. The jugular should be ligated, when pyemic symptoms are marked. We must assume a primary affection of the jugular bulb, when we have before us a perfectly healthy sinus, without periphlebitis and without disease of the vessel wall. If the pyemic symptoms are slight we may await the result of the operation. Well defined symptoms of pyemia, repeated chills or bad general condition necessitate in all cases the immediate ligation of the jugular, a procedure, which even in the less pronounced class of cases, can not be regarded as faulty. In these cases the jugular should be tied high, above the facial vein, while usually the ligation is best made further down in the region of the thyroid cartlage in order to operate with certainty below the thrombus. The ligation of the jugular is followed by the tying of the facial vein and the excision or the incision of the upper portion of the jugular with a probe pointed bistoury. The wound of the neck must remain open. The sinus must also be watched and incised as soon as a septic thrombus becomes manifest. As a rule the operation first exposes the sinus. In all doubtful cases this procedure is an eminent necessity. The examination of the sinus begins with palpation, followed by exploratory puncture for the determination of the nature of its contents. If a solid thrombus be found, it usually suffices to expose the sinus, if no grave pyemic symptoms are present. Even if the jugular vein be free of disease at the time of operation, we need not blame ourselves. should we decide to ligate it for making a useless operation, as a wall-lining phlebo-thrombsis can not be recognized and, when present, may be a serious distributing focus of pyemic infectious material. The incision of the sinus for therapeutic purposes and even more so for diagnostic purposes, when a free stream of blood still flows through it, I hold with v. Bergmann as ill-advised, in opposition to the opinion of Leutert and others. The reasons therefor are evident. The free bleeding after the incision limits our freedom of action. The dressing has to remain in place for a longer time than we would leave it otherwise. The probability of hemorrhage, when the dressings are changed, prevents a careful examination. During the time the dressing must remain in place. the thrombosis may, without interference, spread backward, even if we have prevented its centripetal spread and damage by ligation of the jugular. It can hardly be considered correct to say that by incision the diseased section of the vein can be eliminated from the circulation. It is not always possible during the free bleeding to incise the sinus as far as desirable or through the entire extent of the diseased area. It is furthermore incorrect to assume that the elimination of the circulation of the sinus can only be accomplished by tamponing after the incision. In this locality and especially in the sigmoidal portion of the sinus, the unincised vessel can by careful tamponing be readily so compressed as to make it impossible for blood to flow through it.

Before making an exploratory puncture we must be sure about the position and course of the sinus and about the fact that its lumen still exists. The escape of its purulent contents through a small and obscure fistula may have caused a collapse of its walls. or the exterior wall may have been destroyed entirely, which might cause the inner wall to be taken for the outer portion of the vein. It is necessary to avoid entrance into the cerebellum by pushing the needle beyond the sinus and to be mindful of the fact that a negative result of the exploratory puncture may be due to the needle not having passed through the thickened and thrombotic exterior wall of the sinus. Even with a negative result of the exploratory puncture the thrombus may be partially or entirely of a highly septic character. Different methods have been devised to aid in the decision after the sinus has been incised, as to whether or not the jugular bulb is thrombosed. One of the methods consists in exerting pressure upon the jugular vein after incision of the sinus and watching for the return flow of blood or pus. I am of the opinion that this procedure should be abandoned. It seems to me more rational to ligate the jugular at once, if the incision of the sinus carried as near the jugular bulb as possible, shows the vein to be empty and exposes no thrombus, rather than incur the liability of setting free portions of the thrombus. In cases in which the sinus is filled with blood and a thrombus in the bulb is suspected, the method of digital compression described by Whiting may be used. It consists in compressing the lower end of the sinus and while removing the blood from the portion of the sinus above the point of compression; pressure should be exerted on the sinus with the second finger. Releasing the lower point of compression blood will flow in the absence of the thrombus in the jugular bulb. I can not commend even this procedure.

My own material consists of the following cases:

From the University Ear Clinic, I have published 13 cases operated with incision of the sinus, with 8 recoveries, 3 cases operated with incision of the sinus and jugular ligation, with no recovery. Two of these cases were primarily ligated. I can now add 41 cases to those reported some years ago at Dresden. (In one case, in which the differential diagnosis between meningitis and sinus thrombosis could not at once be made, I ligated the jugular. This case proved to be meningitis.)

Of these 41 cases, 7 were not operated upon with one death from meningitis.

In 18 cases (16 per cent.), the sinus was incised with 4 deaths. In 17 cases the jugular was tied, and in all but 3 the sinus incised as well, with 4 deaths. Of 3 cases without jugular ligation and without incision of the sinus, 2 died. Of the total number, 32 recovered, 8 died, 22 were acute cases, 19 chronic.

The following remarks are based upon cases observed within the last few years. They were 27 cases, of which

16 were acute and 11 chronic; 5 of these cases died, one of which was not operated upon, as the symptoms of meningitis masked the existence of a sinus thrombosis, which was not diagnosed. In 2 fatal cases, the sinus alone was operated upon. One died 4 weeks later of meningitis; the other case died two hours after the operation from heart paralysis, due to a hypodermic of morphin given by her husband, who is a doctor. The autopsy showed many points of cerebral hemorrhage. Ether was used as anesthetic and was well borne; the thrombus was of recent origin, and consisted of blood. The patient had no fever. In the 2 remaining fatal cases the jugular was ligated. Both had primary thrombosis of the jugular. One died of pulmonary metastases; the other died of septic fever on the 12th day after the first appearance of fever. This patient had an acute sanguineous middle ear inflammation of grippal origin. Only a post mortem examination of the brain was permitted.

Of 22 recoveries, 14 had acute and 8 chronic middle ear disease.

In 9 cases the jugular was ligated, either before or after the incision of the sinus.

In one case the sinus was not incised.

In 10 cases the sinus only was incised; in 4 cases a periphlebitic infectious focus was laid bare.

Of special interest was the frequent occurrence among these patients of neuritis optica, which was observed in 10 cases. Sinking of the upper posterior sinus wall was noted in 8-10 cases; the sinus was extremely prominent in 3 cases. Perisinuous abscesses were found 12 times, 4 times entirely encapsulated. The periphlebitis showed itself as a light membranous deposit, or as a minimal thickening of the sinus wall, or as minute superimposed granulations in 6 cases; the sinus wall was found discolored 12 times, and covered with a sequestrum once. Hemorrhage occurred 2-4 times. The thrombus was found solid twice, purulently decomposed twice, partially composed of granulations once. In about 4 cases the condition of wall-lining thrombosis presented itself. The thickening of the sinus wall could be shown to exist by puncture with the aspirating needle. The exploratory puncture showed in 4 cases at first blood only, but after 2 or 3 days no blood or pus.

The mastoid process was full of pus or granulations in 11 cases; sclerotic twice, only hyperemic and free of pus or granulations once and co-existing with a septic decomposed thrombus. The sinus wall showed a large portion missing once; fistulæ were seen 2-4 times. After ligation the jugular vein showed itself empty up to the basis of the skull twice, occupied by a solid thrombus once and by a septic decomposed thrombus 2 or 3 times. Indications of disease of the jugular vein were present 5 times, manifesting itself as pain on pressure, swelling and dysphagia.

The bacteriologic examination was negative once, showing most often the presence of streptococci, and at times staphylococci; once pyocyaneus besides the staphylococcus. Metastases occurred 4 times in muscles and joints; pulmonary abscess once, with recovery. The cerebral complications are of special interest. Abscess in the temporal lobe occurred once; infectious spinal menengitis was observed twice and the diagnoses confirmed by lumbar puncture. One of these cases showed abundant pus present. Both cases recovered.

The course of the fever is of great interest. Of the patients operated upon the sinus alone, 2 had no subsequent fever; one of these had a solid and one a softened thrombus. Another patient with a solid thrombus had minmal temperature for 3 days. Before the operation on the sinus, 6 patients had fever, which ceased with the operative interference. In 2 cases slight fever continued after the operation and considerable fever prevailed in one case of spinal meningitis. After ligation of the jugular, fever ceased at once in 2 cases; continued high for 8-40 and 14-39 days in 5 cases, in some cases due to metastases. In one case fever which had shown a temperature of 39-7, subsided after the second day. Immediate ligation of the jugular vein was performed 3 times. In 3 cases the jugular was tied on the 4th, 5th and 8th day respectively, after the sinus had been incised. The sinus and jugular were operated upon in 4 cases; 4, 8, 9 and 10 days after the mastoid operation. In the fatal cases the jugular had been tied 2, 3, and 4 days after the mastoid operation. In the fatal case, in which the symptoms of arachnitis masked the existence of a sinus thrombosis, the thrombosis had probably existed for a prolonged period of time. In 2 cases we dealt with unquestionable primary bulbar thrombosis, as the sinus contained fluid blood 2 days before the ligation of the septic infected jugular vein. The cerebral symptoms, high continuous fever and delirium, led to the assumption of meningitis in one case until a fall in temperature occurred on the 2d day, which caused us immediately to ligate the jugular. In the 2d case of sepsis the lumbar puncture showed cloudy fluid not under great pressure. The microscopic examination showed streptococci without pus corpuscles. The fatal prognosis based upon this confirmation of the diagnosis of meningitis prevented the incision of the sinus after it became subject to thrombosis subsequent to the ligation of the jugular. In this case of sepsis a metastatic abscess existed in the ankle joint, and phlegmonous inflammatory areas appeared in different portions of the dermis. In another septic case, pulmonary metastases existed.

Adhering to the principles just stated, not to ligate the jugular vein, a priori, in every case of pyemia, where we find only perisinuous abscess, a wall-lining or solid thrombosis. nor to ligate in cases where we have completely uncovered a limited purulent focus in the sinus, which does not lie adjacent to the bulb, I have, in late years, accomplished the following results. Of 10 cases in which the sinus was operated upon, all recovered without prolonged fever. Of 12 cases, with jugular ligation, 3 died. In one of the fatal cases, the sinus had not been incised; it was not incised in two cases which recovered. Prolonged high temperature prevailed in some of this class of cases. It is proper to state that in all severe cases, the jugular vein was primarily or secondarily ligated. 3 cases recovered without operation on the sinus or jugular vein. (2 fatal cases must be omitted: a case of meningitis, in which the diagnosis had not been made, and the case of cardiac paralysis 2 hours after the operation, due to a morphin injection.) These results are far better than shown in Viereck's compilation of cases of sinus operation alone, but considerably worse in the cases of jugular ligation. I have altogether made 50 operations, with 35 recoveries—70 per cent. of these, 30 were sinus operations, with 22 recoveries—73 per cent.

20 were jugular operations, with 13 recoveries—65 per cent.

Cases in recent years:

25 cases of sinus or jugular thrombosis, with 3 deaths—12 per cent., and 22 recoveries—88 per cent.

3 cases were operated upon the mastoid only; 2 cured which leaves

22 cases operated on the sinus or jugular vein, with 3 deaths—13.6 per cent. and 19 recoveries—86.4 per cent.

10 operated upon the sinus, with 10 recoveries—100 per cent.

12 operated upon the jugular vein, with 3 deaths—25 per cent. and 9 recoveries—75 per cent.

From what has been said, the following conclusions are reached:

I. Metastatic pyemia due to so-called osteophlebitis or direct resorption from osseous structure is not conclusively proven; it is at all events rare and is of no practical importance and demands no special regard in our therapeutic procedures.

II. As sources of infection in pyemia we must differentiate and eliminate, either the sinus or the jugular bulb, when the former has been found without infection.

III. When a febrile condition exists with indications from opening the mastoid, the sinus should be laid bare.

SPECIAL INDICATIONS FOR OPERATING ON THE BLOOD-VESSELS.

I. Jugular ligation should be the first act of the operation:

1. When there is no doubt of the existence of jugular phlebitis or

2. When grave septic or septicopyemic symptoms are present.

II. Jugular ligation should be made after exposing the sinus:

1. When the sinus seems normal, without perisinuous

disease and when the pyemic process shows intense differences in temperature with chills.

2. When a phlebitis or wall-lining thrombosis is accompanied by the above conditions.

The sinus should be opened:

1. When a septic decomposed thrombus can be demonstrated.

The result of the exploratory puncture being negative:

2. When the sinus wall seems gangrenous or
3. When repeated chills, intense fluctuations of temperature occur, or the general conditions are bad.
4. When neuritis optica exists, not, however, without exception.

III. Jugular ligation should be made after opening the sinus:

1. When the septic thrombus is or has been adjacent to the jugular bulb.
2. When, after opening the sinus, chills continue, temperature remains high or cerebral symptoms persist.

The demonstrated existence of an affection of the sinus wall or of a solid thrombus does not necessitate of itself an operation on the sinus or jugular vein. These uncomplicated diseases frequently tend to a spontaneous recovery.

Of decisive influence for or against operative procedures is the character of the general infection. The existence of an undoubted diffuse purulent meningitis forms, as yet, a contraindication to operative measures. The demonstration of pus or cocci in the fluid collected by lumbar puncture, should not deter us from operating,

XXXI.

THE NATURE OF DISCHARGES AND DOUCHES.*

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Douches and Irrigants.

Purposes.—A douche or irrigant may have for its object: (1) the mechanical removal of morbid secretions, accumulations, and foreign bodies; or it may be used (2) for antiseptic purposes; or (3) for diagnosis.

Essentials.—To effect satisfactorily these objects the douche or irrigant must conform to certain requirements which vary according to circumstances. 1. The solution employed should, when practicable, be a solvent of the substance to be removed. 2. The reagent should be itself readily soluble in water and form a clear solution. 3. It should be non-irritating to mucous membranes and sensitive surfaces. 4. To ensure thoroughness it should possess the power of penetrating the surface tissues. 5. It should be miscible—i. e., chemically compatible with the most effective antiseptics. 6. It should be economical in cost and readily available. Of these essentials perhaps the most important one is that of having the power to dissolve the discharge, since there are so many solutions in general use which not only have no such solvent action, but actually precipitate and harden the substances which they are intended to remove.

Nature and composition of discharges.—As a preliminary to choosing the materials for a douche it may be expedient to consider the nature and composition of the different discharges and accumulations which demand treatment. So far as our own field of work is concerned, they may thus be grouped: (1) catarrhal; (2) serous; (3) purulent; (4) cerumen and cholesteatomata; and (5) fibrinous and hemorrhagic.

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*Clinical lecture delivered at the Central London Throat, Nose, and Ear Hospital on February 28th, 1901.

1. Catarrhal products as commonly met with in the nose and naso-pharynx and less frequently in the ear may be either viscid or inspissated to the extent of forming "crusts." Coming from mucous membrane the fluid consists chiefly of an alkaline solution of mucin, with globulin and serum albumin in proportions varying with the intensity and nature of the morbid process. Epithelial cells in varying degrees of mucoid degeneration and leucocytes, will be suspended in the fluid, together with varieties of bacteria. Of the organic constituents mucin is readily soluble in weak solutions of alkaline salts, such as bicarbonate of sodium (from 0-5 to 1 per cent.), but insoluble in acids, while cells and serum globulin are soluble in weak solutions of neutral salts, as also the nucleo-albumin of the cells, albumin being soluble in water.

2. Serous discharges rarely call for special removal except when localised. In them globulin occurs in greater proportion than mucin, therefore a neutral saline solution should be selected.

3. Pus will obviously vary considerably according to the conditions of its production and the duration of its retention. It may be thin, viscid, and even solid (caseous), sweet or fetid. According to Hoppe Seyler the proportions of organic solids in 100 parts of dried pus are: proteids, 13; nuclein, 34; fats and lecithin, 14; cholesterin; 7; cerebrin, 5; extractives, 4; and insoluble substances, 20. Halliburton gives nucleo-albumin, cell globulin, albumoses, and peptones as the chief constituents. In the fluid part or serum globulin with small quantities of serum albumin and albumoses will be found, while the organised solid or cell elements, such as leucocytes, connective tissue fragments, etc., will yield nucleo-albumin, cell globulin and nuclein, also fats, lecithin, cholesterin, etc., in varying degrees of fatty and other degeneration. All these are soluble in weak solutions of either neutral or alkaline salts respectively.

4. Cerumen may vary from a thin treacly consistence to that of a firm plug, more or less mixed with epidermal squames, hairs, parasites, dust and other foreign matter. Being fatty in nature it is readily soluble in alkaline salts. But as the duration of contact by an irrigant is so short and the plug oftentimes so dense softening by means of

a strong alkaline solution, preferably in glycerin, is often expedient as preliminary to the douche. Cholesteatomata consist of closely packed laminated squamous epithelium with fatty granules and cholesterin crystals. The cells will yield much keratin and nuclein, both of which with the fatty débris are soluble in alkalies. Sometimes, as in middle-ear suppuration, the epithelium is mixed with pus; if so the neutral salts also should be used in combination.

5. Plastic exudation consisting chiefly of filamentous fibrin entangling leucocytes in its meshes is extremely difficult of solution and rarely admits of more than a softening process by solutions of the neutral and alkaline salts, such as sodium sulphate, calcic hydrate, etc. The same applies to bloodclot, which is, however, less dense and consequently much more readily removed by similar irrigants.

Choice of material for douche.—Knowing the nature of the discharge and the solvents of its chief constituents there will be but little difficulty in selecting an efficient irrigant which shall act both chemically and mechanically. The appended table of reagents in frequent use will facilitate selection. On one side are grouped the solvents, on the other those which either actually precipitate, or at all events do not dissolve, the prevailing constituents of the discharge.

Table of Solvents and Precipitants.

Solvents.	Precipitants
Sodium sulphate (from 1 to 2 per cent.).	Water (except albumin).
Potassium sulphate (from 1 2 per cent.).	Mercury biniodid.
Magnesium sulphate (from 1 to 2 per cent.).	Mercury perchlorid.
Ammonium sulphate (from 1 to 2 per cent.).	Alum.
Sodium bicarbonate.	Zinc chlorid.
Sodium chlorid.	Zinc sulphate.
Sodium hydrate.	Zinc permanganate.
Sodium biborate.	Potassium permanganate

Sodium sulpho-carbolate.
Calcium chlorid.
Calcium hydrate.
Potassium hydrate.
Potassium carbonate.
Chinosol.

Hydrogen peroxid.
Formalin.
Carbolic acid.
Boric acid.
Liquor sodii chlorinat.
Liquor carbonis detergens.
Izal.
Alcohol (fats excepted).
Sulphurous acid.

It will thus be seen that many of the solutions which we most usually employ are not those best adapted to their purposes, since some of them—e. g., the salts of mercury, phenol, boric acid, etc.—actually coagulate or form insoluble compounds with the chief constituents of the discharge, thereby preventing thorough irrigation. One must not ignore, however, the qualification that the duration of contact between the irrigant and the discharge is often so short that either complete solution or complete precipitation of the organic elements can scarcely be expected. Still, it will generally be quite sufficient for the purpose if the matrix is dissolved and diluted so as to facilitate the division and removal of the solid and organised matter—e. g., in the case of "crusts," pus, cerumen, cholesteatomata, etc. This will obviously be more thorough when a solvent of that matrix is employed in preference to a fluid which can at the best act only mechanically. It is scarcely necessary to discuss each agent separately, yet several demand special notice.

Taking water first, this is by no means the most effective irrigant, whether employed as tap or distilled, warm or cold, since of the organic substances albumin is about the only one which it dissolves.

Next in importance are the neutral salts—sodium, potassium, magnesium and ammonium sulphates with sodium and calcium chlorids. These act as solvents of the globulin group, but vary in degree and according to the strength of solution employed. Sodium sulphate is by far the most useful, especially if employed in a strength of from 1 to 2 per cent., but if stronger—e. g., from 5 to 10 per cent. or more—it causes precipitation of proteids. It still further has the property of penetrating organic tissues. This is well illustrated in the action of Müller's fluid (a solution of chromic salts and sodium sulphate) which not only hardens the tissue, but penetrates to its deepest part. Should the chromic parts be used alone, however, the hardening is only superficial. The quality is of the greatest value when dealing with a granulating surface and in economizing cocain.* Sodium sulphate still further has the valuable property of mixing readily with biniodid and other salts of mercury in efficient antiseptic strengths. Calcium chlorid, although not quite so good a solvent, is particularly useful as a hemostatic douche, since calcium salts play an indispensable part in the blood coagulation. Sodium carbonate is perhaps the best solvent of mucin, which forms by far the chief organic substance in catarrhal secretion; it is also a solvent of nucleo-albumins, fatty material, nuclein, keratin, etc.; its strength should be about 0.5 per cent. The same remarks apply to borax (sodium biborate), which salt has the additional advantage of possessing some antiseptic properties. Its strength should be from 0.5 to 1 per cent. Sodium, potassium, and calcium hydrate are valuable chiefly for their softening action upon the tissues and are not applicable as douches, except in very weak solutions since they form a glutinous compound with albumins known as Lieberkühn's jelly, familiar to us in the well-known "ropy" or "gelatinous" reaction between pus and liquor potasse. The first and second are useful when combined with glycerin for softening ceruminous and epidermal plugs as a preliminary to irrigation. Chinosol does not precipitate and mixes well with the neutral salts, but decomposition occurs when combined with alkalies. Distilled water is preferable to tap water.

We will now consider the behaviour of the opposite group, which apart from their purely passive and mechanical action in very weak solutions are either actual precipitants or at all events do not dissolve the matter which they are employed to remove. As before mentioned, pure water precipitates the globulins and has no solvent action upon fats; used alone, therefore, it is not an entirely efficient douche. The salts of zinc—sulphate, chlorid and sulpho-carbolate and permanganata—are chiefly used for their astringent properties, since they form insoluble compounds with the proteids and should only be used as astringents. The same applies to alum and to potassium permanganate. The latter salt may be mixed with sodium bicarbonate or biborate and forms an excellent douche for removing fetid crusts in the nose and nasopharynx. Boric acid is perhaps one of the most favored douche agents, probably owing to its supposed antiseptic qualities, but, unfortunately, it is not a solvent of proteids and therefore does not conform to our essentials. Carbolic acid (phenol) is a powerful precipitant of the proteids; it should therefore be mixed with solutions of sodium sulphate or carbonate, when it will prove a more efficient douche. Care must always be taken that the solution is complete, otherwise the phenol will be simply suspended and will obviously cause much irritation, even pain, especially when used as a nasal douche. Imperfect solution can be avoided by using the best preparations of phenol (absolute or No. 1 carbolic acid) by boiling, by using the above salts, or by diluting glycerin of carbolic acid (P. B.). Formalin is now very popular as a douche, but it is a very powerful precipitant. Peroxid of hydrogen, unless freely diluted, has the great disadvantage of causing rapid effervescence when mixed with pus. This is extremely awkward when irrigating a cavity, such as the maxillary sinus. Izal and liquor carbonis detergens are not only precipitants, but have the further disadvantage of being emulsions and opaque, so interfering with diagnostic evidence. They are also toxic and very irritating to the mucous membranes and require great care in their use. Finally, the inorganic salts of mercury—the perchlorid and biniodid—are most powerful precipitants, readily forming insoluble compound with abumins and globulins.

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*The Lancet, Dec. 8th, 1900, p. 1679.

In addition to its purely mechanical use a douche may be required for antiseptic purposes. But our most valuable antiseptics are precipitants of proteids and therefore not thorough irrigants: consequently it is more often expedient to irrigate first with a solvent and use the antiseptic afterward, as in the case of suppurative middle-ear disease. This need not, however, always be done, since biniodid of mercury, phenol, chinosol, and many powerful antiseptics are not only miscible with pure sodium sulphate, but when mixed the solution do not precipitate proteids so readily as a plain solution of the antiseptic would. This is a property of no slight importance. In the use of potassium permanganate where there is much mucin, as in the crusts found in atrophic rhinitis, a combination with sodium bicarbonate or biborate will be found to afford a very efficient deodorant douche with or without sodium sulphate. Boric acid is so feeble an antiseptic, even by itself, that its combinations need no serious consideration. This, however, does not apply to chinosol, which, mixed with sodium sulphate, affords not only a clear solution, but one having high solvent and antiseptic properties. Its great disadvantage is its cost. Sanitas also mixes well with the neutral salts and its efficiency is markedly increased.

It will thus be seen that few reliable antiseptics, when used by themselves, actually conform to the essentials of a perfect douche, but when combined with a neutral salt their efficiency is undoubtedly increased, this being due in a great measure to an increase in penetrative power.

A protesting word may here be not superfluous with regard to many popular formulae combining thymol, eucalyptol, menthol, and other aromatics with various inappropriate salts which are employed as antiseptic douches. These are not only extremely irritating to the mucous membrane—especially the nasal—sometimes causing great discomfort, but they should only be recommended as deodorants and in those cases which demand stimulating as an adjuvant to the routine solvents—e. g., atrophic rhinitis. When available an economical and efficient douche in cases of atrophic and fetid rhinitis is to be found in sea water. It should be thoroughly well boiled, decanted and used at a temperature of about from 60° to 70° F. A pinch of sodium bicarbonate to the pint may be added when the crusts are very firmly adherent. When employed for diagnostic purposes the douche should be transparent and colorless, hence liquor carbonis detergens, creolin, izal, permanganates, etc., are to be avoided. Likewise, too, it is inadvisable to employ any precipitant such as mercuric chlorid for exploratory irrigation when the exit passage is likely to be minute—e. g., per Lichtwitz cannula in the case of suspected maxillary sinus disease.

Although far from complete, the foregoing selection may be considered as fairly representative of the materials frequently employed as douches and, however true it may be that experience eventually leads us to select that which is most serviceable, the application of our knowledge of physiologic chemistry will doubtless not only facilitate that selection, but also guide us to still further improvements. While disclaiming any intention of suggesting a universal irrigant, experiments in the laboratory and clinical observation amply emphasize the fact that we have in the neutral salts, especially sodium sulphate, by far the most reliable basis for an irrigant, especially when pus predominates, but in many instances already referred to the addition of an alkaline salt will render it even more effective. Whatever formula be employed it must obviously be modified according to the clinical circumstances calling for its use and efficiency will be ensured by practically appreciating the teachings of the physiological laboratory.

The appended formulæ are based upon the foregoing principle, having all been thoroughly tested chemically and clinically, and although selected chiefly for use in connection with disease of the ear and upper respiratory tract they are equally applicable to general surgery.

Formulæ.

1. Sodium sulphate, from one and a half to three drams; water to one pint (20 fluid ounces), from 1 to 2 per cent.

2. Sodium sulphate, from one and a half to three drams; sodium bicarbonate, 40 grains; water to one pint.

3. Sodium sulphate, from one and a half to three drams; borax, 40 grains: water to one pint.

4. Sodium sulphate, from one and a half to three drams; sodium bicarbonate, 40 grains; glycerin of carbolic acid, 45 drops; water to one pint.

Note.—Instead of glycerin of carbolic, absolute phenol nine grains or No. 1 carbolic acid may be used. Heat to 155° F.

5. Borax, 40 grains; bicarbonate of soda, 40 grains: glycerin of carbolic acid, 45 drops; water to one pint (diluted Dobell's solution).

6. Sodium sulphate, one and a half drams; chinosol, 10 grains; water to one pint.

7. Sodium sulphate, one and a half drams; sanitas, three fluid drams; water to one pint.

8. Sodium sulphate, one and a half drams; perchlorid of mercury, two grains; water to one pint (1 in 5000).

9. Sodium sulphate, one and a half drams; red iodid of mercury, two grains; sodium iodid, two grains, water to one pint (1 in 5000).

10. Sodium sulphate, one and a half drams; potassium permanganate, two grains; water to one pint.

11. Sodium bicarbonate, 40 grains; potassium permanganate, two grains; water to one pint.

Note.—Borax (40 grains) may be used instead of sodium bicarbonate.

12. Solution of calcium chlorid (P. B.) six fluid drams; water to one pint.

Notes.—The pure exsiccated sulphate of sodium should always be used in preference to the ordinary crystalline salt. Bicarbonate is preferable to carbonate of sodium. Hot water whenever convenient should be employed to make the solutions. Solutions of phenol should be heated to 155 degrees. No. 1 as a simple irrigant for pus, Nos. 2 and 3 when mucus is present or when the discharge is inspissated, Nos. 4, 5, 10 and 11 for inspissated fetid mucus or "crusts," Nos. 6, 8 and 9 as antiseptics, and No. 7 and 10 as deodorants. No. 12 is chiefly employed for its hemostatic property.

METHODS OF EMPLOYMENT AND INSTRUMENTS.

The selection of an instrument will be guided, first, by the particular purpose for which the douche is to be employed; secondly, whether it is intended for the surgeon's or for the patient's sole use. This distinction is by no means unimportant, knowing how rarely the layman appreciates the possibility of infection and the importance of cleanliness. In this instance he is perhaps not entirely to blame, since this ordinary apparatus at his disposal—e.

g., the rubber ball, glass or metal syringes—are without doubt the most dangerous weapons ever employed. An ocular and olfactory, still more a bacterial, examination of the interior of any syringe which has been much used, will at once emphasise the truth of this statement. The cause of this is obvious: no apparatus that has to be filled by the aperture which comes in contact with the wound can escape contamination of its interior, except through special care which cannot be expected in its domestic employment. In the case of aural and nasal douches, the application to the nozzle of a short piece of rubber tubing, which can be renewed or removed and sterilized, greatly reduces the risk of infection or of injury during self-use. The ordinary form of hydrostatic douche is not liable to infection in this particular way, but it is a somewhat clumsy arrangement and not to be advised for delicate and deliberate work as in aural cleansing, since it admits of but slight variation in volume and pressure.

Dr. J. Dundas Grant's modification of the piston syringe is thoroughly efficient in guarding against septic infection, being fitted with a two-way tap which admits of filling through a separate channel (Fig. 1). This with the ordinary piston glass or metal form is, however, very difficult for the patient to use himself.

The writer's aseptic douche (Fig 2) will be found specially adapted to this purpose, since the patient not only has force, direction and volume of fluid directly under control, but by means of inlet and outlet valves, the irrigator can only be filled at the distal end like a Higginson's syringe, of which it is in fact a modification. It is very wide in its application, but is specially valuable in case of disease of the ear, requiring great care in auto-irrigation and those forms of rhinitis demanding a copious douche. The glass nasal douche (Fig. 3) is particularly useful when small quantities only are required.

It is as unnecessary to describe in detail all the numerous forms of apparatus adapted to special purposes as it is to enumerate and to condemn all those which do not conform to the most rudimentary principles of cleanliness, but it may not be unreasonable finally to emphasise that no apparatus can be safely employed in which one aperture serves both for filling and for emptying.

Fig. 1.
Two-way Syringe.

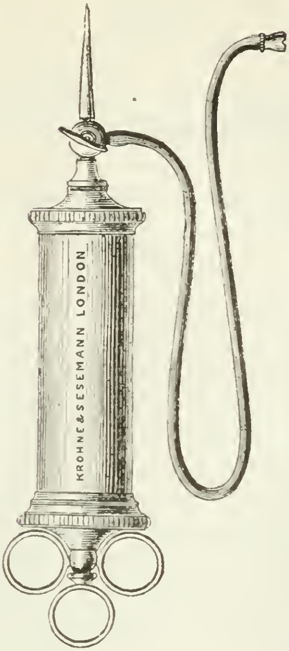
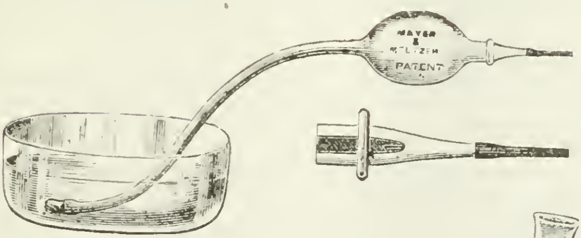


Fig. 2.
Aseptic Aural and Nasal Douche. Nozzle, showing valve.



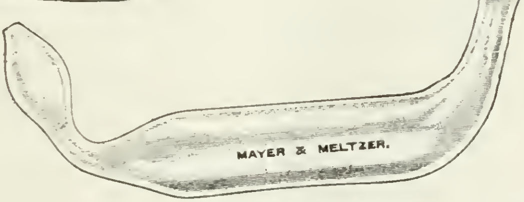


Fig. 3.
Glass Nasal Douche.

XXXII.

THREE CASES OF SIMULTANEOUS OPERATION FOR DOUBLE MASTOID ABSCESS.

By Charles W. Richardson, M.D.

WASHINGTON.

In presenting these three cases for your consideration to-day, I offer them for nothing novel in their etiology, pathology or symptomatology or surgical procedure, but for simply what they represent as three unusual surgical incidents in mastoid work. It is rather unusual, within a period of eighteen months, to have had three such surgical incidents. It is not unusual to have patients with both ears to be simultaneously affected with acute suppurative otitis, nor is it unusal for the suppuration on one side to cease and the other to terminate in mastoid abscess; nor is it unusual for the suppuration on one side to terminate in abscess and require operative intervention, and then, at a later day, the other side to require the same line of procedure; but it is rather unusual to have both ears simultaneously affected with suppurative otitis and, at an equal pace, to go through the successive steps to mastoid destruction.

On July twenty-third, nineteen hundred, I was requested by Dr. Roy to see with him a man who had an acute suppurative otitis of both middle ears for a period of two weeks. The patient was a vigorous man of forty years of age, who had never had an affection of the ear before the present attack of acute suppurative otitis. The invasion of the ears had been preceded by an attack of catarrhal influenza. There was a moderate purulent discharge from both middle ears, as well as exquisite tenderness over left mastoid antrum, extending to the tip of the process, which latter condition had existed for two days. Moderate tenderness over right mastoid was also manifest. Both membranes showed small perforations in the posterior inferior quadrant, slight sinking of the posterior superior canal wall in left auditory canal. Temperature 99.4° Patient excited, apprehensive and nervous. A diagnosis of double mastoid abscess was made, and the necessity for immediate operation decided.

The patient was removed to the Providence Hospital, where preparation was made for the operation to be done the following day. The next morning, the day of the operation, the patient stated that the pain had completely subsided in the left side, and had become very intense upon the right side. On examination, the statement was verified. The left side was first operated upon, and a moderately broken down structure, containing pus, was exposed almost immediately on chiseling through the cortex. A loose dressing was made, and immediately thereafter the right mastoid was operated upon. As in the left mastoid, immediately after penetrating through the cortex, a moderate sized pus cavity was entered. The tip was almost normal, nevertheless taken away. After curetting out the antrum and down to apparently normal bone in all directions, something impelled me to enlarge my bone wound posteriorly, when I entered into a large pus-filled accessory antral cavity, almost as large as the bone field already exposed. This accessory cavity seemed to have no visible communication with the pus cavity previously opened. The patient was in a good condition after the operation, and made an uneventful recovery.

Case II. On March 19, 1901, I was requested to see a young dental student under the care of Dr. Tiefenthaler, who had had a double suppurative otitis for several weeks, following an attack of influenza. I found the patient to be a young man of twenty-eight years of age, excessively pale and very deaf. On examination, I found a profuse purulent discharge from the ears, large perforations in both tympanic membranes, with slight sinking of both posterior superior canal walls. No spontaneous pain, and only slight tenderness, on pressure, over the mastoid antrum. Temperature 100°. I suggested the use of ice, frequent irrigation, and absolute rest for several days. On a subsequent visit, several days later, I suggested immediate operation, which was acceded to, and the patient was then removed to the Columbian University Hospital, where he was operated upon the following day. I first operated on the right mastoid, which I found, on opening through the cortex, to be an extensive pus cavity from the tip to the base, and as far as the cellular structure extended posteriorly. Immediately thereafter, the left ear was operated upon, and found almost as extensively involved as the right process. The right mastoid wound was rather slow in healing, on account of the enormous cavity which was required to be filled up by granulations; otherwise, the progress of the case was continuous to perfect resolution.

CASE III. On December 24, 1901, I was requested by one of my colleagues, Dr. Vincent, of the staff of Providence Hospital, to examine a child in the contagious ward, who had had an acute suppurative otitis, following scarlet fever, for a period of ten days. The patient was a boy of six years of age, convalescing from scarlet fever. Ten days before I saw him, he had developed a double scarlatina otitis, attended with profuse discharge from both middle ears. There had been marked pain and tenderness over both mastoids from the second day of the ear invasion. The temperature for several days had been distinctly septic, with a range from 99° in the morning to between 104° and 105° in the evenings. There was exquisite tenderness over both mastoids, with slight edema. At the same time that the invasion of the ears took place, there also developed some symptoms of nephritis. On the twenty-fourth, there were only twelve ounces of urine excreted. I could not operate upon the child Christmas day, so decided to postpone the operation until the twenty-sixth. The child's condition was very serious, so it became necessary to operate as rapidly as possible. I opened up the right mastoid first, and found the process very dense. After penetrating about half an inch, I opened up a pus cavity which communicated with the antrum. The same condition was found on the left side as noted upon the right. The pus was a thin, watery and offensive liquid. The reaction was good. The highest temperature on the twenty-seventh was 102°, and the amount of urine excreted sixteen ounces. On the twenty-eighth the temperature was normal; the amount of urine excreted dropped to nine ounces. On the twenty-ninth the temperature was normal. In the early morning of this day vomiting occurred, which was soon followed by convulsive seizures and complete suppression of urine. The next day, the little fellow died from nephritis. It is hardly necessary to state that all that medical science could suggest was done to aid the action of the disabled kidneys.

In presenting a paper before a society composed of skilled workers in otology, it seems almost superfluous to outline the typical symptoms indicating the advisability for operative intervention in purulent mastoid infection, nevertheless, I think it important to emphasize certain points in the symptomatology which indicate that a case presenting them has reached the stage where delay endangers life, causes unnecessary suffering, and protracts the recovery. These symptoms are great pain and tenderness over the mastoid antrum and tip, persisting for a period of forty-eight hours or more without abatement from judicious local and general treatment, attended with a profuse creamy or sanguineous purulent discharge from the auditory canal, which pus contains streptococci or pneumococci. The quicker a mastoid presenting the above conditions is opened, the less destruction of cellular elements, the less the danger of serious complication, the smaller the wound area, the shortening of the period of suffering, and the more rapid the recovery with minimal depression and scar. It is remarkable at times how rapidly destruction of mastoid cellular elements may take place. I have operated lately on three cases of single mastoid involvement which showed this to a marked degree.

In July, I operated on a man five days from the initial pain in the middle ear and found the mastoid extensively broken down and filled with pus. In November I operated on a woman six days from the initial symptom of pain in the ear, with a similar revelation as to the condition in the mastoid. Both of them were strepticocci cases. Two weeks ago I operated upon a young woman eight days after the initial ear pain and found extensive purulent involvement of the tip. This was a pneumococcus case. In performing the mastoid operation, I believe that the most radical procedure is the only safe method. It is only through opening into the antrum, opening all cellular structure, and removing the outer wall of the tip that one can safeguard his patient against separative pus pockets, which will require secondary operations if left undisturbed. Several times in doing the mastoid operation have I found a similar condition as noted in the right mastoid of case number 1. Such a case would be incomplete unless these cavities had been opened up. In several instances, also, I have done what appeared to be a complete and thorough operation for mastoid abscess, until I chiseled off the outer surface of the tip, thus exposing cells filled with pus, and demonstrating how incomplete would the operation have been unless this procedure had been adopted.

XXXIII.

DISEASES OF THE ACCESSORY SINUSES.

By Robert C. Myles, M. D.,

NEW YORK.

The subject that has been assigned to me is a broad one. I shall treat it in an epitomized manner, giving rather a condensed statement which will chiefly embrace my experience in the treatment of this class of cases. It has been said that nothing is so unreliable as statistics, except some men who make them; nevertheless, statistical evidence is an invaluable aid to a discriminating mind and should be given preference over assertions.

The principal physiologic function of the nasal accessory cavities is to supply fluid secretion and warm air to the nose and to aid the sounding-board apparatus of the head. The usual causes of diseases of the pneumatic sinuses are to be found in bacterial activity, either primary or secondary to mechanical conditions, generally the latter, the acute infectious diseases being the greatest offender, the so-called polypoid changes second, and the pathologic changes at the root ends of the teeth, third. When we shall have perfected the art of preventive medicine, we will hear less of accessory sinus diseases; our duties will direct us to restore the nares to as near a physiologic condition as our science will permit without injuring, permanently, the structure of the nose. Serious conferences with dentists will greatly reduce our incomes from the antrums. Proper nursing and intelligent interference at the crucial time will considerably reduce the number of chronic cases. The pathologic changes vary from venous intumescence to many necrotic and formative conditions.

The diagnosis, prognosis and treatment will be considered under the individual sections. In the majority of cases of empyema of the antrum of Highmore the diagnosis is easily made. The introduction through the hiatus semilunaris of the properly curved silver irrigation tube has enabled the writer, in the majority of cases, to settle the diagnosis at once. After using the electric light and listening to the arguments of others concerning its worthlessness, he retains and uses it as one of his valuable aids in making the diagnosis. It is not the pus which prevents the transillumination, but the swollen tissues and the blood within them. Pus in the middle meatus issues from the antrum, the anterior ethmoidal cells, or the frontal sinus, or from all of them. Placing the top of the patient's head on the floor and at the same time requiring him to blow forcibly through the suspected nostril, will demonstrate a quantity of pus in the middle meatus in many cases in which the antrum is at fault, and in which the secretion is more or less liquid. The passing of a trocar through the middle or inferior meatus will confirm the diagnosis in suspected cases in which it cannot be made by the previously mentioned methods.

But there is one class of cases in which this method will fail—those in which there are polyps, thick mucus, and colloid material. The prognosis in antrum diseases depends upon the extent and location of the pathologic changes as well as on the method of procedure adopted by the surgeon. Since it is not possible for the surgeon to anticipate the exact diseased condition before operating, nor always possible for him to determine the extent of the disease when operating, failure to obtain the best results in every case must necessarily occur. Some of the apparently worst forms of antral empyema have been cured by the extraction of a tooth and a few weeks irrigation through the socket. On the other hand the writer has seen cases of trivial discharge, the only symptoms being a moderate post-nasal catarrh, which. after a thoroughly radical operation, consisting of the removal of the anterior inferior wall of the antrum, thorough curettage of the internal walls. and gauze packing for weeks, have terminated in most obstinate purulent and insubordinate pyogenic conditions. Since we cannot obliterate the antrum without objectionable results, we must try to restore its functions without destroying too much of the lining membrane. The writer believes that he was the first to insist upon not treating the antrum according to thorough surgical principles; in other words, he believes that the thorough curettage frequently induces a worse condition than the disease for which it is employed. It is his rule, in cases of long history and severe disease manifestations, to make large openings through the region of the canine fossa and malar ridge and counter-openings through the inferior or middle meatus, followed by a gentle and careful curettage of the mucosa and a firm and decided curettage of whatever bare bone may be found. The cavity is then packed with aristol of iodoform gauze, which has been passed through mercuric bichlorid solution. This packing is never allowed to remain longer than a week. At the expiration of this time the mucous membrane is inspected occasionally, the exuberant granulations are removed with the curette, and the cardinal principles of free drainage and free admission of air are utilized as far as the conditions of the individual case will permit, supplemented by various forms of tubing and re-incision of the membrane as it closes over its aperture. The writer from time to time has had patients who apparently were cured by treatment through a natural opening, but these evidently were cases in which purulent semi-decayed collections had formed and acted as a leaven to perpetuate the suppurating foci.

In frontal sinus cases the diagnosis at time is extremely difficult, but, as a rule, the silver irrigation tube can be inserted into the sinus and an injection of normal salt solution makes the diagnosis clear by bringing away a quantity of purulent matter. In the severer types of these cases the headaches which come on in the morning and pass off in the afternoon are almost pathognomonic. This headache may be explained by the fact that the gas, which, during the night, escapes through the infundibulum, ceases to do so when the patient assumes the upright position, and gravity fills the infundibulum with muco-purulent matter. By the afternoon the pressure of the gas has forced the muco-pus through the naso-frontal canal or infundibulum, when the gas escapes and the headache ceases.

The writer has been accustomed to employ three methods of treatment. The first consists of the total obliteration of the sinus, either by removing the anterior inferior frontal sinus wall and every vestige of the mucous membrane of the sinuses, the cavity then being packed with gauze. This method succeeds brilliantly in cases of small sinuses, but in those patients in whom sinuses are large and extend outward and backward above the orbital cavity, the treatment is tedious, slow and unsatisfactory. The second method is utilized in cases of large sinuses. Part of the anterior wall is removed, careful curetting of the mucosa and bare bone is employed, and as large an opening as is feasible is made from the sinus to the nose with an especially constructed trephine and chisel. Special efforts are made to remove those portions of the nasal process of the superior maxillary bone which forms a part of the floor of the frontal sinus. It has been the custom of the writer to endeavor to relieve all forms of acute and chronic frontal sinusitis by removing the anterior end of the middle turbinal, and a part of the anterior ethmoidal cells, as well as the lower walls of the naso-frontal canal and infundibulum. This was formerly done as a preliminary step in cases in which external operation was intended, but so many cures resulted from this procedure that he now employs it as the first step in the treatment, with the hope of effecting a cure through this avenue; if this fails, it makes the external operation easier and more effective.

The diagnosis of ethmoidal cell disease is usually so easily made that "he who runs may read." In cases of latent empyema in the individual cells, the diagnosis is frequently not made until the patient has been under observation for some time. The writer has found the soft silver probe invaluable in ascertaining the conditions of the respective cells. In nearly every case it is wiser to remove a part or all of the middle turbinal at the outset. In the polypoid cases all visible polypoid tissue has been taken away with the excisor forceps or snare, and the floors of the sinuses removed with especially constructed guarded trephines, and with the author's lateral and antero-posterior cutting forceps. His malleable-handled curettes have proved most serviceable in removing the intra- and intercellular diseased tissue and walls. The securing of free drainage and free admission of air hold as cardinal principles here as well as in the antrum.

Diseases of the sphenoidal cells, in the writer's experience, have been the most easily diagnosed. The treatment and technique employed have been more satisfactory, and results better, than those obtained in the treatment of the other sinuses. Pus issuing from the uppermost region at which the septum joins the sphenoidal bone, and careful probing, will indicate the direction from whence it comes. Complete removal of the posterior end of the middle turbinal will usually demonstrate the point whence the pus makes its exit. The anterior upper wall should be penetrated with a guarded awl or an obtuse-angled curette. Extensive removal of the anterior wall with cutting forceps, gentle curettage, irrigation, and repeated excisions of the membrane, which forms over the openings, have cured, for the writer, the most obstinate and apparently hopeless diseased conditions of the sphenoidal sinuses.

XXXIV.

THE ETHMOIDAL CELLS.

By Eugene L. Van Sant, M.D.,

PHILADELPHIA.

The ethmoidal cells, or sinuses, from the anatomic position, are not only very liable to disease, particularly of septic or inflammatory nature; but, being situated, as they are, so close to the ostia or openings of the other nasal accessory sinuses, it is almost impossible for them to be diseased, without affecting the other sinuses; or, indeed, for the other sinuses to be diseased and to have the ethmoidal sinuses escape.

The following is a brief resumé of some of the more important of the anatomic features of the ethmodial sinuses. These cells, or sinuses, consist of a number of thin walled, cellular cavities, lying within the lateral masses of the ethmodial bone. They vary greatly in number, size and shape. Most anatomists divide them into anterior and posterior cells. This separation into two groups is made by taking the attachment of the middle turbinate bone as a line of division. All those cells communicating with the middle meatus of the nose, are called anterior ethmoidal cells; while those communicating with the superior meatus are called posterior ethmodial cells. In the disarticulated skull, many of these cells appear to be broken; but when the bones are properly articulated, they form perfect cavities. Those on the upper surface are closed in when articulated, by the depressions, or fovæ, of the ethmoidal edge of the orbital plate of the frontal bone. Those situated auteriorly are closed in by the lachrymal bone and the nasal process of superior maxillary, while inferiorly, articulation into the ethmoidal edge of the orbital plate of the superior maxillary, and posteriorly, with the lateral mass of the sphenoidal spongy bones, and the orbital process of the palate, complete the cellular structure.

The anterior cells may greatly predominate over the posterior cells, and reach far backward; or the opposite condition may prevail and the posterior cells reach far forward.

The number in each group varies greatly, although there are generally more of the anterior than of the posterior cells. The anterior cells usually communicate with the middle meatus by several ostia.

Some of these ostia open into the infundibulum on its outer and posterior aspect. These are sometimes spoken of as "infundibular cells." Others communicate directly with the middle meatus, and open into the groove of the semilunar hiatus, below the line of the origin of the middle turbinated bone.

The posterior cells frequently have but one ostium, although there may be two or more. The posterior openings are usually larger than those of the anterior cells. They communicate with the superior meatus, above the middle turbinated bone, and lie deeply, being concealed by the overhanging edge of the superior turbinate body. Occasionally, an additional ostium is found in the incisura ethmoidalis superior. This is usually found when a so-called spheno-ethmoidal cell is present. Particular attention should be directed to certain ethmoidal cells that at times are found lying very close to the other accessory sinuses. Thus, occasionally, the roof of the maxillary antrum contains one or more air cells which, in the articulated skull, complete certain of the ethmoidal cells. These have been called "maxillo-ethmoidal cells." Again, we may find an upward and forward development of ethmoidal cells toward the cavity of the frontal sinus, making a distinct prominence on the floor of that sinus, to which prominence the name of bulla frontales (Lathrop), has been applied. These cells that protrude thus forward and are situated close to the floor of the frontal sinus are known as the "fronto-ethmoidal cells."

Again, we may find a posterior ethmoidal cell projecting backward into the body and lesser wing of the sphenoid bone, encroaching upon a region of the sphenoid sinus. These cells are called spheno-ethmoidal cells. From their intimate relation, it may be readily seen how diseases, affecting these maxillo-ethmoidal, fronto-ethmoidal cells, or spheno-ethnoidal cell would soon affect the cavities to which they are so closely joined.

Situated in the hiatus semilunaris is a rounded bony prominence named by Zuckerkandl "the ethmoidal bulla." Its size varies, and greatly influences the width of the semilunar hiatus. It contains one or more ethmoidal cells, which communicate directly with the middle meatus by an ostium, on its superior aspect. From the position of its ostium, drainage from the interior of the ethmoidal bulla is necessarily imperfect.

The ethmoidal cells are lined by a thin muco-periosteal membrane, containing mucous glands and covered by a layer of ciliated epithelium. The intermediate position of the ethmoidal cells, being posteriorly in close contact with the sphenoidal, and anteriorly with the frontal sinus—the opening of the anterior cells being so close to the frontal and antral ostia, and the upper antral wall being so largely composed of the ethmoid bone, all render them very liable to extension of diseases from and to the other sinuses.

Moreover, the situation of the ethmoidal cells, and the fact of their multiplicity, make them particularly liable to extension of septic or inflammatory diseases from the nasal chambers, and to occlusion of their ostia by local turgescence, growths, or foreign bodies.

The ethmoidal cells may be affected by a local expression of certain specific inflammations (syphilis, tuberculosis, etc.). When this is the case, appropriate local treatment is no less necessary, such as applications to ulcerations, removal of necrotic bone, etc., but the main reliance must be upon remedial measures directed to the general disease.

The ethmoidal cells may be the seat of new growths. Of these, myxomata are the more commonly found. Cases of fibromata, sarcomata and carcinomata have been reported. The treatment consists, whenever possible, of the thorough removal of the growth. It occasionally occurs that a malignant growth from the cells is mistaken for a polyp. One instance occurred in a case in a town near Philadelphia, in which the physician in charge removed part of a sarcoma, under the impression that he was removing a polypus. Uncontrollable hemorrhage followed, and two days later the patient was brought to me in Philadelphia.

At that time he was nearly exsanguined and fainted while being examined; but anterior and posterior nasal plugs, hypodermoclyses of large quantities of normal salt solution, with rest and appropriate general treatment, revived him, only, however, to be followed by a fatal result about two weeks later, owing to the rapid growth of the tumor, involving the frontal sinus and orbit, with metastases to the brain. It is very probable that the inflammation produced by the operation, and the lessened vital resistance of the patient, from the hemorrhage, had caused the rapid extension of the growth.

Catarrhal and suppurative inflammation of the ethmoidal cells, are the conditions that most frequently demand our attention. These are very prevalent, and frequently exist unsuspected. There is no doubt that many cases of acute and chronic rhinitis, of purulent rhinitis in children, and of atrophic rhinitis, are accompanied and sustained by associated lesions of the ethmoidal sinuses. Again, as previously pointed out, it is unusual to have an inflammation continue long in the neighboring accessory sinuses, without involvement of the ethmoidal cells.

Catarrhal inflammation of the ethmoidal cells is usually associated with an acute rhinitis. More rarely, it occurs during the course of certain infectious diseases, such as measles, scarlet fever, typhoid fever, pneumonia, diphtheria, etc. Influenza is a very frequent cause.

In acute catarrhal inflammation, the mucosa is reddened, swollen and congested, being infiltrated with round cells, and is accompanied by a profuse, serous exudation. This condition may soon subside and be followed by resolution; or continuing, may become chronic, and later take on a suppurative condition. The clinical symptoms are ill-defined, consisting mainly in a greater severity of pain and discomfort than usually accompanies a rhinitis. At times, careful examination will reveal a catarrhal discharge proceeding directly from the cells. Should these ostia of the cells become obstructed, and the exudation be retained under tension—the symptoms are greatly aggravated; and deep-seated pains may be felt over the root of the nose, or be referred to the posterior region of the orbit. If the posterior cells are involved, the patient is apt to refer the pain also to the temporal region. Acute catarrhal inflammation of the ethmoidal cells usually ends in resolution. Treatment is directed to the nasal inflammation present—rest, purgation; application of hot water over the nose and face; and cleaning of the nose with warm alkaline washes, give much relief. When associated with an acute rhinitis, I have seen good results from the internal exhibition of the following prescription.

℞ Acetanilid..................................gr ij.
Compound Morphin Powder...........gr j.
Bromid of Soda.........................grs v.

Given every hour until 4 or 6 doses are taken. Should the secretions be retained within the cells, efforts should be made to promote drainage by opening their ostia; or, if the distension be great, free incisions should be made.

If the catarrhal inflammation takes on a chronic form, it is apt to become suppurative, through secondary bacterial infection.

Suppurative inflammation of the ethmoidal cells may be acute or chronic, and either condition can be further modified by obstruction of the ostia, leading to confinement of the secretion within the cells.

Acute suppurative ethmoiditis presents the same general etiology as the acute catarrhal inflammation of the cells. Influenza of late years has been a very frequent cause, the infecting agent being of the mixed character. Traumatism and operative procedures in the nasal chambers may at times be followed by acute suppuration of the ethmoidal cells. The symptoms and treatment are about the same as for the acute catarrhal variety. The pain, however, is apt to be more severe and, if the pus is confined, early incision is imperative in order to prevent the invasion of the neighboring cavities.

Most cases of suppurative ethmoiditis, however, present themselves when the condition is already a chronic one. Chronic suppurative ethmoiditis, as already stated, may be the sequence of a previous simple material condition that has become infected with pus organisms. Obstruction of the nasal chambers, from growths, deflection of the nasal septum, or other morbid intra-nasal conditions, by causing a chronic congestion of the lining mucosa and retaining secretions, are very frequent causes. The abnormal width in the unobstructed nostril, in cases of nasal septal deflection and in atrophic rhinitis, particularly exposes the ethmoidal cells of the corresponding side, and leads to chronic suppuration within them. Syphilis, especially in the tertiary stage, scrofula and tuberculosis are important factors in the causation of chronic purulent ethmoiditis. Foreign bodies in the nose are also a cause.

In chronic suppuration, the mucous membrane lining the sinuses, becomes thickened, frequently presenting a boggy, swollen and gelatinous appearance. Granulations and soft polypoid processes, not infrequently spring up from the mucous membrane. This swelling of the membrane may effectively block the openings of the sinuses. Later, the bony partitions between the cells necrose, and come away mixed with the secretion in delicate particles.

Symptoms. Quite a number of cases of purulent ethmoiditis show but few symptoms, except a slight chronic, nasal discharge. Such cases have been spoken of as "latent empyemas."

Usually, in addition to the discharge, the patient complains of more or less constant pain, which is usually referred to the forehead or post-region of the orbit, or to the temporal region. Not infrequently a diffuse, dull, heavy feeling in the head is complained of. The pain is greatly increased by retention of the secretion, under pressure. It is the writer's opinion that although complete retention, in cases of suppurative ethmoiditis (the so-called closed empyema), is comparatively rare, still a partial retention of the secretions is almost always present. The ostia of the cells are not well placed for constant drainage, and many cases are complicated by intra-nasal obstructions, that also may prevent good drainage from the cells. The nasal discharge is usually of a tenacious, muco-purulent character, with a creamy white appearance, but it may vary, at times being more mucoid, at times more purulent. An intercurrent rhinitis will frequently increase the discharge and cause it to become more purulent. An offensive odor to the discharge may be present, and this odor may be perceptible to the patient. The disease usually is unilateral, but both sides may be affected. The discharge, especially from the posterior cells, has a tendency to flow back into the naso-pharynx and causes cough, hawking, dryness of the throat and huskiness of the voice. Being swallowed, it leads to digestive disturbances, and may even cause a slight, chronic, septic condition of the patient. The senses of smell and taste are frequently disturbed; being greatly lessened and, at times, absent. Rarely the patient complains of a peculiar taste to everything he eats.

Not infrequently, the patient's spirits and intellectuality are affected. Mental depression, inability to sustain prolonged mental application, or to study, may be noticed.

When retention of the pus continues, pressure symptoms, in various directions from the cells, may be present. Ocular derangement, with pressure symptom of the orbit, and its contents, is frequently noticed. Optic neuritis is not uncommon. The patient, in cases of this character, suffers from intense pain. The abscess may evacuate itself in various directions, emptying usually into the nasal chamber. or one of the other accessory sinuses. At times, it opens in the orbit, particularly at the inner angle, and we do not forget that it may empty into the anterior fossa of the skull.

The diagnosis of chronic suppurative ethmoiditis, is greatly aided by inspection, leading to the determination of the existence of a nasal discharge and its origin in the cells. At times, the removal of intra-nasal obstructions, or of the anterior end of the middle turbinal, greatly aids in the examination, and indeed may be indispensable. Careful probing may release pent-up secretion and by means of air douche, the secretion may be blown out of the cells. The frequency of involvement of the other nasal sinuses, must also be taken into consideration.

The examination is greatly aided by shrinking the nasal mucosa by topical applications of solution of cocain and adrenalin chlorid. The situation of the ostia should be remembered; and, if the posterior cells are involved, we can best determine that fact by posterior rhinoscopy.

Transillumination is not of much value in the diagnosis. In the severe cases, the retention of pus, the pressure symptoms would greatly aid the diagnosis. The prognosis of chronic, purulent ethmoiditis, is uncertain, and depends greatly upon how carefully treatment is carried out.

In the treatment of chronic suppurative ethmoiditis, thorough drainage of the cells, removal of the purulent secretion, and the diseased portions of the cells, are the essential points. All intra-nasal obstructions to discharge from the cells, should be removed. The frequent association of nasal polyps with this disease, demands careful examination for their detection, and their thorough removal. In the great majority of cases, it is best to remove the anterior end of the middle turbinate; if the posterior cells are involved, the entire middle turbinate should be removed. The author's method of removing the anterior portion of the middle turbinate, is to cut through the bone, close to its attachment, with a powerful pair of scissors, or such forceps as the Grunwald's nasal forceps, and then with the cold wire snare remove the entire anterior portion. Application of solution of cocain and adrenalin chlorid greatly facilitates the procedure. After removal of all nasal obstructions, and the necessary part of the middle turbinate, the cells should be examined, and if found necrotic, or filled with granulations, thorough curettement should be done. For this purpose, a ring knife or the Myles or Bryan curette, or the Grunwald forceps, may be recommended.

In order to check the bleeding, and to prevent secondary hemorrhage, it is well to lightly pack the part after the operation, with small strips of gauze. These may, if necessary, be saturated with a styptic solution, soaked in a ten per cent. solution of alumnol.

Syringing the cells with a current of hot air is very advantageous, by removing secretions from the cells, and lessening the congestion of the lining membrane. The author's hot-air syringe is well adapted for this purpose. A plan of treatment that has given the writer a number of favorable results, is to remove any nasal obstruction as well as the anterior portion of the middle turbinate. Then later, when the site of the operations is healed, to continue the treatment by syringing the cells with hot-air, and by means of a Blake's inner ear syringe to inject antiseptic solutions into them. Of such solutions, a 5 per cent. watery solution of protargol, and 10 per cent. to 20 per cent. solution of ichthyol, may be recommended.

The patient should frequently douche the nose with a warm, mild, antiseptic solution, to remove all secretions, and promote drainage.

Hot water applications, over the root of the nose and face, also seem to be of benefit, and they certainly give much comfort to the patient.

The patient's general condition should be looked after. All digestive disturbances, constipation, etc., should be corrected. Should syphilis or gout be present, appropriate general treatment is necessary.

In a number of cases, after establishing drainage, etc., I have found a change of air very beneficial to the patient, such as a prolonged stay at the seashore, or in the mountains.

In those severe cases, associated with orbital abscess, or where a fistula has been formed, an external cutting operation is usually required. The fistula should be enlarged and the diseased ethmoidal cells opened.

If found necessary, the ethmoidal labyrinth may be opened by prolonging the usual external incision, made in opening the frontal sinus, downward, toward the inner canthus of the eye. The periosteum, along with the soft parts, should be raised, and the inner wall of the orbit exposed. The communication into the cells sought for, and a free passage should be established into the nasal chambers.

The possibility of involvement of the other sinuses, in the suppurative process, should be borne in mind, and if present, appropriate operative measures should be taken, in order to prevent re-infection of the ethmoidal cells, and make the relief permanent.

XXXV.

PROGNOSIS IN CHRONIC CATARRH OF THE THROAT AND EAR. SOME REMARKS BY A WOULD NOT BE PESSIMIST.

By Thomas J. Harris, M. D.,

NEW YORK.

What are you accomplishing in your cases of catarrhal disease of the throat and ear? What degree of success are you really attaining? This is a question which the writer often hears asked and is deserving one most honest, candid consideration. Let us at the very outset say that the brilliant and altogether gratifying results achieved in acute affections of this region are not for a moment called in question nor yet the marvelous progress made in suppurative disease of the ear or the accessory sinuses of the nose. It is that large group of cases which, for lack of a better term, we refer to as chronic aural or chronic nasal catarrh, that in our judgment deserve a frank soul to soul discussion.

These cases come to us all. They form indeed a great share of our clientele in spite of the fact that the frequency of reports of large operations at our various meetings would lend to give a contrary impression. So I ask if we are all getting the results we want, or if we ever get discouraged? It is said, a man may repeat an erroneous statement so often that in time he comes to believe it true. Is it possible that some of us, in our commendable zeal to encourage our patients, come to believe that we are securing the results that we would like to have? Statistics are proverbially misleading and never more so than in regard to results of treatments. We are all liable to the common error of generalizing from one or two individual cases. Some of my hearers, as I now read, have in mind and are prepared to report some satisfactory result as the result of the treatment to the ear. But what of the ninety and nine cases which did not improve? What we are seeking to-day are not your exceptional, but your average results, covering a period of years. Another possible source of error, whether in our hospital or office records, is our inability to keep our cases under observation. Improvement takes place as a result of treatment and we record him as cured or benefited. Too often he drops out of sight and appears later in some other institution with all his improvement lost and the history that as soon as he stopped treatment he began to get worse.

Let us consider for a few moments now, the large group of cases known as aural catarrh. For our purpose we do not need to go into the pathology of this affection nor do we need to deny that catarrh is at the best an indefinite term. We all know that as a result and often hand in hand with the exudative process, bands of thickening and adhesions are thrown out all over the tympanic cavity. When this has taken place and the adhesions are fully organized, what promise of success in affecting a cure of the catarrh is there? The two symptoms of the disease are deafness and tinnitus. As to tinnitus who will deny that we are still seeking for a cure and that in many instances it is impossible to relieve it. In combatting the deafness our success is greater, but we again ask how often is the improvement maintained, unless the case is continually under treatment!

Any question along the line of therapy brings to mind at once the classical methods of Politzer. We use them: But are they as satisfactory as we were formerly wont to believe? We establish the patency of the tube by catheter or otherwise when it is closed—what ground is there for believing we will be able to keep it open? Does not the cause of the catarrh reside back of the tube? And even in a patent tube how can we confidently hope that air or even oil or vapor will dissolve the adhesive bands when well organized. In this relation any form of treatment to the tube, even as promising a procedure as the use of the electric bougie, must fail. The cause of the stenosis has not been reached. So firm is he in his belief in the futility of all local measures addressed to the ear per tubam, that the Nestor of aurists in this country, Dr. Herman Knapp, informed the writer that he had entirely abandoned the use of the catheter and not a few aurists agree with him in this. Of that other mode of local therapy, measures addressed to the middle ear by the auditory canal, there seems to be equal skepticism on the part of some of our best men. Dr. Clarence J. Blake stated recently before the Otological Section of the New York Academy of Medicine that except in a very few cases, massage to the drum membrane was not advisable and was liable to do much harm. This leaves only surgical measures and we all agree that while much has been expected from these and claimed for them, in the hands of most of us who have tried them, they are disappointing.

The discouraging outlook in these cases is acknowledged by as strong a believer in radical measures as Dench, who, in his Diseases of the Ear, says: "If the impairment of function is considerable in a patient under thirty we can scarcely hope for great improvement except by the employment of the most radical means at our command." Our most promising field for work seems to lie in combatting the cause, which it is generally agreed, is found in a majority of cases in the nose or naso-pharynx. This seems most rational, and such treatment to-day forms a constant part of every aurist's work. But are the results equally sure? Granted that your upper respiratory tract is put in healthy condition, will this influence the evil already done to the ossicular chain and drum membrane through adhesions? Or, how can any nasal treatment hope to influence that slow insidious process, often without any complaint on the part of the patient as regards the nose, which results in an anchylosis of the stapes.

When we turn to consider catarrh of the nose and throat, pure and simple, the result of our special work at first sight seems much more gratifying. It would be foolhardy to gainsay that all of us have had the most encouraging results in our surgical work toward relieving the symptoms of catarrh. Who has not seen just the relief desired come from the removal of a spur! But is it always the case? Here again as in aural catarrh we are too often seeing the results and some remoter cause. It is rather to your failures that we would point if you have any. The personal equation here, as elsewhere, enters into the severity of the symptoms. Long since the writer has abandoned judging the intensity of the symptoms.

either of the nose or throat, from the clinical picture. Over and over again we see most marked pathologic conditions with little or no complaint, and again great and persistent distress exists with little recognizable local disturbance. There is no more common error than to associate cause and result between some distressing symptoms and a local abnormality.

It is almost impossible to believe that marked nasal obstruction can exist for years without producing symptoms referable to ear or throat, and yet we constantly meet patients with prominent spurs or deflections with little or no complaint. As Dr. Wright once said: "How many a turbinated has been sacrificed in the vain hunt for a local cause."

All true prognosis depends on a successful inquiry into the cause. This is equally true in diseases of the region under discussion as elsewhere. It has just been shown that often an apparent cause is not the cause at all. Fortunate it is for surgeon and patient alike, when such is the case! When the removal of some prominent spur gives the desired relief, what satisfaction! But what shall we say of that still larger group of cases where the benefit is in whole or part lacking? In these cases it is clear that the cause is more remote or less evident and even in those cases where relief or apparent cure is effected by local treatment are we in most instances doing more by our turbinectomies, cauterization, snarings or what not, than removing the results of some remoter cause? And we ask, is such treatment alone strictly scientific. What prevents an undisturbed cause producing a like result? There is in the great majority of all cases of catarrh some general underlying cause which must be combatted. We do not forget the role that sinus involvement may play in what we call catarrh, nor the far-reaching results of the presence of adenoids in childhood. But should we stop here? What produced those adenoids years ago? Whatever physiologic grounds may be advanced for their presence (and such a reason most rational in many ways has been recently advanced by Brieger), there is, we are confident, in many cases a general constitutional cause, and unless this cause can be found and removed, all adenotomies and other operations will only temporarily avail, and the catarrh will break out afresh in some new form. This case may be the so-called lymphatic diathesis. In others, and the number is not a few, it is some chronic derangement of the gastric intestinal canal. In still others, the excess of uric acid in the blood seems to be the cause. But whatever it may chance to be, our success in securing a complete and permanent cure, depends in no small measure in how accurately we recognize it. It is true that occupation and climate play their weighty role, but usually with other conditions thoroughly controlled, we can rise superior to these. Is it then speaking too positively if we say that if we get discouraged in treating these chronic affections, it is because we look too intently at the local picture and disregard the rest of the system? Or, if we consider the latter, that in too many instances we are yet unable successfully to cope with them.

For a long time the writer marveled at the relief afforded to patients who come into the hospital after an absence and said as they could not come to receive local treatment, they had been taking Dr. Somebody's tonic. Subjectively there was certainly much improvement. Objectively there was no change.

To conclude we would venture to assert, then, even with the knowledge that some confreres will differ:

(1) That our progress in the treatment of chronic catarrh of the ear has been very little (contrast the advance in diagnosis).

(2) That our chief success to-day rests in our ability in setting aside the producing nasal catarrh.

(3) That tubal therapeutics and pneumo-massage are at the best too often of temporary benefit and in the hands of some even of decided harm.

(4) That a promise to check the deafness is often all we can promise with safety.

(5) And that prophylatic measures are of greatest value, especially the early removal of the ever present adenoids.

In naso-pharyngeal catarrh we can speak more hopefully in saying, that undoubtedly in every instance it is capable of at least temporary cure by attention to some local cause, but that what seems a local cause in not a few cases is not the real cause. In many cases where a local cause does not exist, we must look for it in some general dyscrasia, the removal of which is essential to success in combatting the catarrh and that this in all instances is not possible.

XXXVI.

STENOSIS OF THE LARYNX. (ABSTRACT.)*

By J. Price-Brown, M. B.

TORONTO.

Stenosis, as a medical term, means constriction or narrowing of an opening or tube. It may exist in all degrees, from a mere diminution of the natural calibre of an organ down to complete closure. When applied to the larnyx, it implies an amount of constriction, within the cavity itself, sufficient to interfere with respiration. This interference may or may not be sufficient to endanger life. A very large majority of the cases of laryngeal stenosis which occur, are due to conditions arising within the larnyx; while the small minority owe their origin to pressure from without, occasioned by external pathologic conditions. The stenosis may not only be variable in degree, but variable in duration likewise; the conditions being in some cases temporary, in others permanent, or until relieved by medical or surgical measures.

Stenosis of the larnyx may be either congenital or acquired. The large majority of the cases are of the latter character; while the former, or pre-natal is so rare as to have been considered by some writers as non-existent. In the museum of the Royal College of Surgeons, London, no specimen can be found; and no less an authority than Mr. Bland Sutton asserts that, "the larnyx is, of all organs, the least liable to malformation."

Nevertheless cases of congenital stenosis do occasionally occur. They may be divided into the following:

1. Congenital Syphilitic Stenosis, as in the case reported by Fraenkel, in which a child three months old died of laryngeal stenosis, post mortem examination revealing necrosis of the cricoid and arytenoid cartilages and the presence of intra-laryngeal abscess.

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2. Vestibular Stenosis. This is caused by the presence of limp and collapsible vestibular walls, and is characterized by an approximation of the aryepiglottic folds and an excessive curling in of the epiglottis, producing more or less stenosis.

3. Diaphragmatic or Web Stenosis. The most severe case of this class on record was reported by Sir Felix Semon some years ago. At birth the infant's cry was weak and hoarse and attended by stridor. At the age of seven years the stridor, although always present, had improved somewhat. Later on the stridor increased again. At the age of sixteen years the larnyx was examined. The movement of the vocal cords was perfect, but between the anterior three-fourths of the cords was a symmetrical, somewhat transparent, triangular membrane. The free border was crescentic, considerably thicker than the rest of the web and white in color. The remaining opening was laterally oval and less than one-third the normal size. The borders of the membrane were attached to the cords, the latter being distinguished from the diaphragm by their greater bulk and rounded form. On attempted phonation the vocal cords came almost together; and the web appeared to form a fold below their level. The voice was hoarse, almost aphonic. The dyspnea increasing, operative treatment became imperative. As a rule, however, pre-natal web formation is of a less formidable character, being confined to the extension of a band between the anterior portions of the vocal cords. Siefert has observed and reported a remarkable series of four of these cases having occurred in one family. Chiari's case appears to be the only one recorded, out of a total number of about twenty, in which the web had formed between the posterior ends of the vocal cords.

The congenital deformities of the posterior commissure are usually in the form of bifurcations or dilatations. Morell Mackenzie reported one in which, associated with cleft palate, there was bifurcation of the epiglottis, extending downward as a distinct fissure between the arytenoids and the posterior surface of the cricoid. The epiglottis in this case formed two flaps which fell into the larnyx. From birth there were constant symptoms of laryngismus ending in suffocation at the age of four months.

A cleft in the inter-arytenoid region is usually the result of defective development. Congenital dilatations of the larnyx in the form of pouches or laryngoceles, although very rare, sometimes occur, producing stenosis by the apparent prolapse of the ventricle.

Acquired stenosis may be classed according to its cause, and may be the result of a large number of different pathologic conditions. The situation may be above, between or beneath the vocal cords, or in two or all three localities combined. There are certain symptoms common to all cases of laryngeal stenosis. All involve to a greater or less degree the power of respiration, the act of inspiration being usually affected more than that of expiration. Except in cases of acute spasm of the glottis and sudden edema, the onset is usually slow, commencing with slight interference with normal breathing, inspiration gradually becoming stridulous.

In cases of young children, it is often difficult or even impossible to obtain a laryngoscopic vision. In these cases, direct linear inspection by means of Kirstein's autoscope should accomplish a good object, by giving a direct view of the larnyx, without reversion as in the use of the laryngoscope. When the view is obtained, the appearance of the larnyx varies greatly according to the cause which produced the stenosis. As Asch has well said: "In edema we have a smooth shining swelling, differing in color according as it is produced by acute inflamation, tuberculosis or Bright's disease. In syphilis we have a ragged, deformed irregular larnyx, sometimes filled with vegetations and sometimes obstructed by membranous bands of adhesions. In cancer we find ulcerated masses, sanious and vegetating. In perichondritis the deformed condition of the larnyx and the presence of abscess point to the nature of the disease; while the appearances of polypi and of spasms or paralysis are at once observed on examination."

One characteristic symptom common to all cases of laryngeal stenosis, is the increase of dyspnea during the hours of sleep, owing to the fact that the crico-arytenoidei-postici muscles, the dilators, are withdrawn during that period from the control of the will. As the disease advances, respiration becomes more difficult, the air supply to the lungs diminishes, and oxygenation of the blood is interfered with. By-and-by the face becomes cyanotic and to save or prolong life, tracheotomy or intubation may be called for.

While the diagnosis of the existence of laryngeal stenosis may not be difficult, to ascertain the nature of the lesion which produces it in a given case may be very difficult; and will, after the period of infantile life, imperatively call for the use of the laryngoscope. If the stenosis is simply the result of contractions or adhesions, the nature of these may be readily discovered by the use of this instrument; but when excessive edema is present the cause is not so easily ascertained.

The principal pathologic conditions which produce acquired stenosis are the following:

Neuroses, which may divided into Acute Functional, Chronic Functional, and Organic.

Acute functional, in the form of spasm of the crico-arytenoidei-laterales and the arytenoideus, is of frequent occurrence in child-life. These muscles stimulated to tense activity overcome the abductor muscles, and, preventing their normal action, interfere materially with respiration. In many cases the spasm is of temporary duration—the stridor lasting for a short period, to be followed by relief—after which the old symptoms of stenosis may recur or not, according to the character of the case. The classical laryngismus stridulus or spasmodic croup is of this nature; and while very alarming to the friends of the little patient, is rarely fatal. The causes producing this condition, are usually congestion or inflmmation in some part of the respiratory tract, either subglottic or pharyngeal; while in others, the spasm is considered to be purely of a reflex character. Probably of the latter form were the two fatal cases of neurotic stenosis reported by Clement Hunter.

These cases were so unusual that they are worth recording here. The first was that of a twin boy aged 19 months. The other twin had died at the age of 1 month. The child was reported as perfectly well, when the mother lifted him out of the bed to give him his regular bath. In a fit of passion he threw his head back and ceased to breathe. His face became blue and his muscles rigid. He was put into a hot bath but without avail, and died at once without uttering a sound.

Two days later the sister of the boy, aged 7 months, was seized in a similar manner. She had always been a healthy child. Suddenly, while lying on her mother's knee, she became rigid and blue in the face, and without uttering a sound died exactly as did her brother.

In both these cases the seizure was accompanied with carpo-pedal contractions. There was no general convulsions and in neither case had there been crowing respiration at any time. Post-mortem examination found both bodies well nourished, all the organs in a healthy condition; and neither foreign body nor obstruction in the larnyx of either. There were, however, marked signs of the presence of rickets in each—a condition said to be a strong predisposing factor in the development of spasm of the glottis.

A word here in reference to the stridor of laryngeal spasm. The crowing sound so frequently heard is the sign that the spasm is relaxing, and the air entering the partially closed glottis. When the attack is fatal, no sound is produced, as no air can enter. When an observation can be obtained during an attack of stridor, the vocal cords will be found in a state of adduction, the notch between the parallel lines being almost absent during inspiration; and presenting the form of a very narrow isosceles triangle during expiration.

Chronic functional neurosis of the larnyx. This condition may occasion a certain amount of stenosis while the neurosis continues, although it is rarely dangerous *per se*. It is a condition of general paresis of the recurrent nerve; and is supposed to be occasioned by toxic influence upon the nerve centres.

Organic neurosis of the larnyx producing stenosis. That the abductor muscles of the larnyx are always more vulnerable to organic nerve lesions than the adductors is a generally conceded fact; and many authorities go as far as Sir Felix Semon, who lays it down as a law that paralysis of the adductor is always secondary to paralysis of the abductor muscle.

Krause has advanced what is called the spasm theory;

that instead of paralysis of the abductors, it was clonic spasm of the adductors that produced the stenosis.

Grossman combats the theory of Semon, based upon a series of experiments, but his view, apparently, is not supported by adequate clinical investigation.

A contribution to the study of toxic paralysis of the larnyx, which has also a bearing upon stenosis of that organ, is given by Heymann. It contains a resume taken from fifty papers on the subject. Lead poisoning is responsible for a majority of these cases. There are also instances of paralysis arising from copper, antimony, phosphorus and arsenic; as well as cannabis indica, atropin, morphin and alcohol. In these cases, although there were exceptions, the abductor muscles were the ones that were in the main effected.

In support of Krause's view that the apparent paralysis of the abductors is really due to continued spasm of the constrictor muscles, Gougenheim and Solis-Cohen ascribe the resulting atrophy of the dilator muscles, as reported by Bosworth. to be due to mechanical rather than paretic immobility.

Acute edema of the larnyx is an infrequent but dangerous cause of laryngeal stenosis. It is usually sudden in its development, and may occur either as a primary disease, or secondary to some other affection. It is a condition of the larnyx attended by infiltration of the submucosa, due to exosmosis from the lymphatics and blood vessels.

Primary edematous laryngitis is exceedingly rare, and may be occasioned by fractures of the cartilages, inhalations of irritating vapors, escharotics, etc., or may be due to inflammatory action in adjacent structures, abcesses, wounds, etc., or as a secondary effect from syphilis, carcinoma, tuberculosis, myxedema, syringomyelia, Bright's disease, phlegmon of the peritonsillar tissue, etc., etc.

The symptoms in acute edema are markedly laryngeal. Dyspnea and loss of voice, with pain upon movement, or upon efforts at deglutition or phonation all come on rapidly. If relief is not obtained, cyanosis, mental distress, and restlessness followed by hebetude, quickly apappear; the temperature rises, and after a day or two the patient dies.

Inspection will show epiglottis and arytenoids swollen and a view of the interior of the larnyx out of the question. In some cases all that can be observed by the use of the laryngoscope will be a distorted mass of edematous tissue.

When the disease is less acute, and owes its origin to some chronic systemic dyscrasia, the symptoms are less alarming; and although the case may be hopeless, the condition may last for weeks before producing a fatal issue.

On examining by the laryngoscope, in the milder forms of the disease, only certain parts will be found to be seriously affected; the swelling being localized about the epiglottis, arytenoids, ventricular bands or subglottic region; or some of these combined without the whole of them being distended. Lake's illustrations of laryngeal tuberculosis are good examples of this kind.

The color of the mucous membrane in edema varies from a grayish pink to a bright red—the tissues are full and rounded, and the membrane bright and glittering. There is usually copious secretion; though it is not necessarily of a purulent character, if the mucosa has not been broken.

Stenosis of the larynx from the presence of pseudomembrane is of frequent occurrence. This usually takes the form of laryngeal diphtheria, being an extension of the disease downward from the pharynx. When the false membrane is deposited upon the laryngeal walls it lessens the capacity of the organ, thereby diminishing the power of respiration. Sometimes false membrane has been formed within the larynx as the result of swallowing hot or caustic fluids.

Perichondritis as the result of fracture, simple or compound, will occasion stenosis of a severe character. The latter is particularly liable to be fatal, probably more so than incised wounds of the organ.

When perichondritis is the result of specific disease, such as syphilis, tuberculosis, actinomycosis, glanders, etc., it is usually accompanied by swelling with streptococcal, staphylococcal or pneumococcal invasion. Purulent infiltration follows, dissecting the perichondrium from the cartilage, producing necrosis and rapidly developing abscess formation. The result is usually extreme stenosis In the majority of instances of perichondritis due to typhoid fever the infection and inflammatory action are similar to those seen in abscess formation, which, making for the point of least resistance, open in ulceration on the mucous surface. The typhoid bacillus is usually present in the necrotic mass.

What Lake terms acute fulminating perichondritis of tuberculosis is accompanied by all the signs of acute edematous laryngitis with high fever and severe stenosis, demanding immediate tracheotomy; while the chronic variety produces less stenosis, as by slower action, ulceration, exfoliation and expectoration of necrosed cartilage, follow each other in regular order.

In perichondrial abscess of the cricoid, the stenosis is most severe and the danger imminent, owing to the greater swelling which occurs in this region. When several cartilages are involved, the prognosis is most unfavorable. In nearly all cases, however, life might be prolonged if tracheotomy were performed early in the disease. The presence of a purulent sac within the larnyx would preclude the advisability of intubation.

What Gerhardt terms "chorditis inferior hypertrophica" owing to the fact that it is attended with local subglottic hypertrophies, sometimes occurs, and may be productive of a serious degree of laryngeal stenosis. The "chronic blennorrhea of Stoerck" likewise produces hypertrophies and cicatrices, but on the vocal cords instead of beneath them. Klebs says that histologically the elements in blennorrhea resemble those of rhinoscleroma. It is a question whether both conditions are not of the nature of pachydermia. When cicatrization takes place in the subglottic hypertrophy it assumes the form of a firm, white, glistening membrane, sometimes completely encircling the sub-glottic ring of the larnyx, producing more or less permanent stenosis. Cicatricial bands in blennorrhea chronica may produce a similar result.

Cicatrices are scars left by the healing process after destruction or injury of normal tissue. Hence these can only occur when nature makes an effort to repair the organism, parts of which either from disease or injury have been destroyed. The formation of scar-tissue is a pathologic process of a purely provisional character, the tendency after development being toward constant contraction. Consequently when cicatrices occur in the larnyx, the stenosis which they occasion is more likely to increase than diminish.

Syphilis when it occurs in the larynx is, of all constitutional diseases, the most likely to be followed by cicatricial stenosis. This never occurs, however, in the early stages but in the tertiary period, years after the original infection. It is then that the gummy syphilide of Fournier and deep ulceration summarily destroy the tissues; and it is nature's effort to repair the wholesale destruction that produces the cicatrization. The parts usually affected first are the epiglottis and arytenoids. Still no region of the larynx can be considered free from the possibility of infection. The tendency is to gradually extend to the surrounding tissues. When the cartilages are partially or wholly destroyed, they make their way through the ulcerated surfaces of the mucous membrane, being discharged intralaryngeally, rarely through the external wall.

Lupus also gives rise to stenosis by the formation of cicatricial tissue. The narrowing of the laryngeal lumen due to cicatricial contraction in an old case of lupus is characterized by a general matting together of the parts until the opening may be almost obliterated. There are several instances on record of this character. The tissues are usually anemic, except when small red nodules give evidance of acute inflammation.

Leprosy of the larynx is always attended by more or less dyspnea; stenosis of the glottis being a prominent feature whenever the larynx is attacked. Phineas Abraham reports a case in which the glottis was reduced to the size of a duck-quill, necessitating tracheotomy to prolong the life of the patient.

Tuberculosis of the larynx is frequently the cause of stenosis, and may occur in several ways. Perhaps the most frequent is in the form of submucous infiltration of the epiglottis and arytenoids as shown by Lake. Paralysis of the vocal cords due to glandular pressure upon the recurrent nerve is of not unusual occurrence. Hyperplastic formation within the larynx, immobility of the arytenoids, from anchylosis of the articulation, granulomata, and papillomata, may any of them so lessen the lumen of the larynx as to produce stenosis. It may be safely said, however, that cicatricial stenosis never occurs in tuberculosis of the larynx. The whole tendency of the disease is toward destruction. Repair after surgical measures does sometimes occur; but the prior destruction in these cases is never so great as to seriously lessen the size of the cavity after the process of healing is accomplished.

Glanders sometimes attacks the human subject. When it does the larynx is often affected. Simultaneously with the development of tubercles and ulcers in the respiration tract, infiltration takes place in the laryngeal mucous membrane. Secondary edema may give rise to dyspnea; and when healing occurs, contraction of cicatrices may give rise to severe and permanent stenosis.

Leucocythemia. Otto Barwick and Eppinger throw new light upon the pathologic condition of the larynx induced by this disease. In the parts rich in glands, especially the epiglottis and false cords, catarrh occurs with swelling of the mucous membrane. Small lymph tubercles may form throughout the lining membrane of the larynx, and the tops of these may ulcerate. While blood-cells accumulate in large numbers in bloodvessels, the characteristic infiltration takes place in the form of small islands, which have been termed leukemic infarctions. When the tubercles or nodules are in exposed parts, they readily break down by ulceration and hemorrhage occurs from them. The most important of clinical features is the laryngeal stenosis, which the diffuse leucocythemic infiltration sometimes produces. In some cases this infiltration comes on very rapidly; and is followed by death in a very few weeks.

Gout is sometimes the cause of serious spasm of the larynx. Watson Williams reports a case of this nature; as also does Allbritt.

Benign tumors of the larnyx give rise to more or less stenosis according to their character and location. They rarely, in the adult, attain a size great enough to endanger life, although involvement may be sufficient to materially impede respiration. Of all forms of neoplasm occurring in this region, papillomata are the most frequent. They occur at all ages. In adult life they are usually discrete or single, and although they may give rise to serious symtoms, they are rarely the cause of severe stenosis. Multiple papillomata, on the other hand, occur most frequently in young children, sometimes studding the vocal cords and the whole interior of the larynx, and seriously interfering with respiration. Some authorities look upon the presence of adenoids in the nasopharynx as the chief cause. Quinton says that in 31 cases of papillomata in children and young adults, he found adenoids in all but three. The contact of the dry and often dusty atmosphere with the tender mucous membrane of the larynx in mouth breathing, is supposed to be the irritating cause of the formation of these growths. Many authorities give over 50 per cent., as the proportion which papillomata bear to all other neoplasms of the larynx including both benign and malignant. Next in frequency come fibromata. They occur singly as also do myxomata, fibro-myxomata, angiomata, lipomata, adenomata, cystomata, etc. The two latter are exceedingly rare. The symptoms produced by all these growths are very much alike, varying according to the size and position of the neoplasm. It takes a larger growth to produce stenosis in the supraglottic than in the infraglottic region, while tumors situated upon the vocal cords, although smaller than in the localities mentioned, are much more likely to produce spasmodic stenosis.

The discovery of the neoplasm can only be made by the use of either the laryngoscope or autoscope; and the nature in many cases only by microscopic examination of a minute section of the pathologic body.

The prognosis in benign growths is rarely unfavorable. They can usully be removed by endolaryngeal methods; and in the case of multiple papillomata of children, which bears so large a place in the sum total of cases, they will shrivel and exfoliate or be absorbed, when by surgical treatment, the mucous membrane of the larynx is relieved of the irritation of respiration.

Malignant disease. This may occur in different types, all being histologically the same as when found in other organs of the body. The usual form in which it occurs in the larynx is either epithelioma or encephaloma. Scirrhus and sarcoma are more rare. Encephaloid cancer is rapid in its development, and causes stenosis by filling up the interior of the larynx with an irregular, mammillated, light rose-colored, fungus mass. Epithelial cancer is slower in development, but like the former difficult to diagnose. In early stages it resembles a large and irritable papilloma. One distinguishing feature in nearly all malignant growths is the formation of glandular enlargement in the sub-maxillary and cervical regions.

The principal laryngeal symptoms, as in the case of benign growths, are the gradual loss of voice and the presence of increasing laryngeal stenosis, but accompanied by more pain and fetor. The diagnosis will depend on physical symptoms together with laryngoscopic and microscopic examination. When visible indications become apparent, it is not always easily distinguished from syphilis and will require constitutional treatment to verify the condition. With tuberculosis it is not so likely to be confounded. The removal of a small piece of growth for microscopic examination should remove all doubt, although W. N. Mackenzie condemns a resort to this means of diagnosis, as too hazardous to the patient. As the disease advances, vegetative hypertrophies fill up the larynx, become more observable, and render the diagnosis more certain. The prognosis is always bad, the patient dying from one to several years after the inception of the disease, and not infrequently from asphyxia the result of the stenosis.

Foreign bodies within the larynx may from their presence produce stenosis. A number of such cases have been recorded, relief being obtained by their removal. In other cases the lesion caused by the foreign body notwithstanding its removal, has been followed by stenosis. Bruggisser reports the case of a man, aged 24, with a rubber plate containing two false teeth in the larynx. It was removed on the eighth day, but was followed by complete abductor paralysis; and tracheotomy had to be performed to relieve the stenosis. Kiaer relates the case of a man who died of laryngeal and pulmonary tuberculosis. He had suffered much from stenosis. On post-mortem examination, a tooth was found in the distended ventricle of Morgagni. It had probably fallen into the larynx after extraction and had been coughed into the ventricle. Its presence may have been the primary cause of the fatal disease.

Laryngeal stenosis from external causes is due to compression upon the larynx. Probably the most common cause is goitre, particularly the enlargement of the central lobe or isthmus. In exopthalmic goitre this is particularly noticeable. In some cases the stenosis from compression is so great that the recumbent posture has to be abandoned and the sitting one assumed even during sleep. Abscess, aneurysm, enlarged scrofulous glands, and neoplasm in the region of the larynx, may any of them produce compression upon the larynx sufficient to induce stenosis; and in some cases the extension of portions of the morbid growth to the interior of the larynx has aided much in producing this condition.

XXXVII.

REPORT OF A CASE OF THYROID GLAND TUMOR IN THE LARYNX.*

By Walter A. Wells, M.D.,

WASHINGTON.

Although it is generally the aggregation of clinical observations—their numerical strength—which gives to them scientific value, nevertheless, for special reasons, we are sometimes deemed justified in making report of a single isolated case. This is generally thought to be allowable when the case in question is either extremely rare or unusual in some respects, or if it present features which seem to throw light upon some unsettled pathologic questions, or if (as even single cases sometimes do), it permits the deduction of certain practical conclusions.

The case which I shall here report is certainly entitled to the claim of rarity. Freer, in the Journal of the American Medical Association for March 30th, 1900, has summed up the literature of cases of normal thyroid tissue in the larynx, and has himself reported the ninth case on record of this interesting group. That malignant growths penetrating the larynx are also little numerous is evident from the circumstance that I could find not more than a dozen references to cases of this kind in the very comprehensive index of the Surgeon-General's Library.

In addition to the rarity of the case I here report, it presents certain peculiarities which I think are not without interest in their bearing upon the pathology of this subject. One of these is the question which has been much mooted, at least with regard to normal thyroid tissue in the larynx, whether or not they are true accessory glands of embryologic origin, or whether they are due merely to the extension of the growth inward through the trachea.

A second point of interest is one relating to the malig-

[*Read before the American Rhinological, Laryngoloical and Otological Society, Washington, D. C.]

nancy of these thyroid growths. In my case, a marked inconsistency is to be noted between the histologic report and the clinical history, inasmuch as three years ago a microscopic diagnosis of adeno-carcinoma was made and nevertheless the patient seems to be in as good general health to-day as ever. Still another feature of the case here reported, which may perhaps have some practical interest, was the fact that I made use, in operating upon the growth, of the hemostatic effects of gelatin—and apparently with most excellent results.

Clinical History. Mrs. D., aged 50, had been for about ten years the subject of a goitrous enlargement or struma of the neck, with which had been associated no symptoms of consequence except a difficulty of swallowing.

In the past two months two new symptoms having rather suddenly developed, viz: dyspnea and hemorrhage from the throat, the patient, at the instance of Dr. Barton, consulted me for the first time in August, 1899.

Questioned as to family history, the patient claims to have come of healthy stock, that no one of immediate relatives had goitre, nor had been the subject of cancer. Her mother, who had died at an advanced age, was afflicted with asthma. One of her sisters suffered a great deal from headaches. There was no history of hemophilia in the family, so far as known.

The patient herself had been generally healthy, with the exception that she had suffered some from headaches, and a bronchitis which often came on in the winter, but cleared up completely in a short while. A cold would occasionally fall upon the throat, giving rise to hoarseness.

There is an indefinite history of syphilitic infection, for which patient was treated six or eight years ago.

In the winter of 1895, she underwent the operation of hysterectomy at Columbia Hospital. A few days after the operation, a violent secondary hemorrhage took place. The patient was completely exsanguinated and resort was had to hypodermoclysis.

Again upon removing the ligatures, another profuse hemorrhage took place, which gave the physicians a great deal of concern and trouble.

A few months before coming to me symptoms had set in, apparently due to compression of trachea and esophagus.

What she complained of first and most was a sensation of choking. Swallowing was so difficult that for nearly two months she had taken nothing but liquid food. and very little of that. Deglutition was facilitated, she had learned, by assuming the reclining position.

Dyspnea was not always present, but came on somewhat paroxysmally and reached such a degree at times that tracheotomy was thought of, and probably would have been done except for the very unfavorable circumstance of so large a goitre.

The patient seldom complained of pain in the tumor itself, nor did she have pains radiating to the ear, shoulder or chest, as often complained of in malignant thyroid tumors.

In the early part of July, while making some kind of an exertion, a hemorrhage occurred from the throat and lasted for a considerable time. In two or three days, without any apparent cause, another took place, the patient claiming to have bled as much as half a pint. The hemorrhages, each time profuse and obstinate, now occurred at the rate of three or four a week for a month or more.

In the middle of August, when I first saw the patient, her weight was 140, about 30 pounds less she claimed than what it was ten years earlier. Her appetite was poor, but there was no indication of trouble with stomach or lungs.

Objective Examination. The thyroid enlargement on the outside of the neck was considerably greater on the left side than on the right, extending upward on the left side to a level of the superior border of the thyroid cartilage. In the median line it extended nearly to upper border of sternum.

It was rather hard and nodular. and the skin was adherent and the growth apparently adherent to the cartilage; the isthmus was enlarged, but the right lobe none or but little over the normal size. There were no sub-clavicular glandular enlargements.

Laryngoscopic examination disclosed a tumor occupying the superior aperture of the larynx, much larger upon the left side than upon the right.

It seemed to spring from somewhere in the ary-epiglottic region. and it pressed forward, distorting the epiglottis and completely preventing a view of the laryngeal glottis.

It was of uneven, lobulated surface, somewhat deeper in color than surrounding membranes.

The mere touching of the growth with a cotton protected applicator provoked hemorrhage lasting for some hours. The removal of a small piece of tumor with forceps was followed by hemorrhage which was controlled with great difficulty and which set in again after the patient returned home, and continued for hours. As, notwithstanding the danger of hemorrhage, something had to be done because of the increasing dyspnea, I decided to operate by way of the mouth, using gelatin as a styptic.

November 5th. Piece near the epiglottis, of about the size of a hazel nut was removed by cold snare. Gelatin applied freely. Hemmorrhage moderate and by no means so great as expected.

November 22d. Another piece of same size removed, under same precautions. Hemorrhage even less than before.

December 3d and again December 7th pieces removed. Gelatin used. Hemorrhage slight.

The symptom of dyspnea was relieved considerably and the patient considerably, but on account of the continuing difficulty in swallowing, or choking, as the patient described it, it was decided to remove the enlarged thyroid on outside of neck. This was done in January, 1900, by Dr. J. Wesley Bovee.

The laryngeal tumor continued to reform, and during the spring following it was found necessary every few weeks to repeat the snaring operation. Hemorrhage, however, which had been such an alarming feature in the beginning, was now never anything extraordinary, and it was found that the gelatin could be dispensed with.

As well as could be made out by laryngoscopic examination, the tumor seemed to be a broad base growth, having its chief seat in the pyriform fossa. The electric cautery was sometimes used in order to eradicate the growth as completely as possible. The vocal cords never seemed to be involved and no view could be caught of any growth situated below the glottis.

The patient passed subsequently from under my care, but

I learned authentically that large pieces had still to be removed from time to time; that she has remained free from the most distressing symptoms of her early history, viz: dysphagia and dyspnea, and that at the present time she has her customary weight and enjoys in general, fairly good health.

Here let us insert the report of the microscopic examination, which was made with great care by Dr. Behrend, Professor of Pathology at the Georgetown Medical School.

"The tumor tissue from the throat presents a papilliferous proliferating structure, with delicate fibrous tissue stroma containing blood vessels. The papillæ are lined with cubical to short columnar cells and are from one to several layers in thickness. Here and there among the papillæ or epithelial branches are found alveoli lined with a cubical epithelium and containing a colloid substance. These structures are identical with those found in the thyroid gland and indicate the seat of the new growth. In one of the specimens the irregular and somewhat curvilinear edge of the tumor was clearly made out as advancing toward the epithelial surface of the pharynx, by an infiltration of the papilliferous offshoots of glandular tissue. A section of the thyroid tumors removed by thyroidectomy showed the characteristics of a colloid goitre. It consisted of a large number of irregular small and large alveoli containing colloid substance. Here and there small groups of cells which might represent undeveloped follicles in which there has not yet been deposited colloid material. In some of the alveoli a papilliferous growth of the epithelium could be distinguished in the interior of the alveolus. Between the aveoli in parts, long strands of epithelial tissue, which represent an atypical proliferation with a score of delicate fibrous tissues, indicating their origin from the papillæ, originating no doubt from typical alveolar cells. Between the regions where the alveolar formation was most like the normal thyroid and the regions represented by tissues from the inner throat (where little or no characteristic alveolar structure could be made out, but where the papilliferous atypical or infiltrating cell proliferation was marked), there were all gradations. The tumor may be considered as analagous to those forms of papilliferous cystoma of the ovary, in which the papillæ break through the cyst walls, infiltrate surrounding tissue and produce metastasis. Tumors which in the beginning are benign, through extensive proliferations of the epithelium into surrounding tissue (which is a criterion of malignancy), become malignant. In the tumor under consideration, we have evidently what was, in the beginning, a colloid goitre. The epithelium here and there began to proliferate and form papillary excrescences, which finally broke through the alveolar wall to grow irregularly. Such a region of marked change evidently occurred toward the inner side of the throat, and accounts for the gradual increase in size of the growth at this point, the point of greatest adherence from the normal thyroid structure. The microscopic diagnosis is adeno-papillary carcinoma on the basis of an old colloid goitre."

Taking a rapid survey of the literature of thyroid tumors in the larynx. we meet first with that interesting group of nine cases, in which the interior of the larynx or trachea was found to be occupied by normal thyroid tissue. The first such case was reported by Ziemmsen (Speciellen Pathologie u. Therapie, Bd. IV, 1876, p. 411).

It was diagnosed in the necropsy, during life it being only known that a tumor of some kind existed in the larynx. Tracheotomy was done to relieve the dyspnea and the patient died from erysipelas. The other cases of normal thyroid in the larynx or trachea are reported by Bruns (2 cases), Heise (2 cases), Roth, Paltauf and Baurowiez and Freer (each 1 case). Another case has been reported by Radestock, but it is not accepted as one of genuine thyroid growth. It is a fact worth mentioning that four of the nine cases were discovered in the same clinic, viz: two reported by Bruns and two by his assistant, Heise, which goes to show probably that such cases are, after all. not so rare, and would be oftener seen if we but keep on the lookout for them.

The cases were mostly in patients from twenty to thirty years of age; one patient was but 15 years; one as old as 40. Six out of the nine were females, and in every case the growth was located below the vocal cords, generally at about the cricoid cartilage or the first or second ring of the trachea. In all but one case the tumor was located posteriorily. This was the last case reported by Bruns in which it seemed to be growing from the anterior wall of the trachea.

Before the time of Paltauf these intra-tracheal growths were generally regarded as accessory thyroids, they being supposed to have originated in intra-uterine life by the aberration of portions of the thyroid gland in the course of the development of that organ.

Accessory thyroid glands have been known for many years to occur in other regions in the neighborhood of the mother gland, most commonly on the sides of the neck, at the base of the tongue, and about the hyoid region. They were mentioned as long ago as 1755 by Albert von Hallen, although the first lucid description was by the Italian, Luigi Porta (delle malatti e delle operazione della ghriandola tiroidea, Milano, 1849, p. 8), in 1849.

A number of instances are reported of accessory thyroid in the region of the trachea, between the trachea and the esophagus and surrounding the aorta, and they are not difficult to explain when we recall the manner of development of the thyroid body as it has been described by His (Entwickelung der Schildruse, Berlin (1880), and Quénu (Les arcs branchiaux chez l'homme, Paris, Thesis, 1886) and others.

In the beginning. the median part of the thyroid body is situated between the lingual tubercle which will form the body of the tongue and the 2d or 3d branchial arch which will form the root of this organ.

As the embryo develops the thyroid gland descends, leaving, as a vestige of its journey, a little narrow canal between the body and root of the tongue, known as the canal of Bochdalek or the thyroglossal duct. Little parcels of the thyroid gland become easily detached during embryonic life at a time when the thyroid has not yet attained its fibrous envelope, and most often become lodged at the location of this canal. Those tumors found lower down around the bifurcation of the trachea or arch of the aorta, are from detached pieces which the aorta has carried with it in its descent.

But it is not so easy to explain upon the embryonic theory the occurrence of thyroid tissue in the interior of the larynx or the trachea, especially as Kolliker and Luschka have clearly shown that they are not formed by two halves originally separate and later united, and therefore we have no ground for supposing that the thyroid becomes included in the course of development.

It happened that in 1891 Paltauf (Beit. z. path. Anat. u. z. allg. Path., Jena, 1891, XI, 71-90), had occasion to examine, post mortem, one of these cases which had been under treatment in Prof. Schrötter's clinic. On account of the dyspnea, dilatation of the trachea was practiced, and with apparent benefit, but finally an abscess was produced in the left thyroid lobe, which ended fatally. Paltauf made very painstaking dissection in this case and was able to demonstrate that a direct connection existed between the enlarged thyroid and the intra-tracheal growth. The thyroid body was closely adherent to the trachea and it was found that the thyroid tissue had grown into the perichondrium and had invaded the interior of the trachea by its progress through the interstitial spaces between the tracheal rings.

So convincing was Paltauf's demonstration of this case, that ever since, the theory of the embryonic origin of thyroid tissue in the larynx has been abandoned, and it is generally held to be an extension of thyroid tissue from outward in through the interstitial membrane of the trachea itself. There is only the case reported by Radestock that could not be explained in this way, but as doubt exists in regard to the diagnosis, it will have to be left out of account. A much greater difficulty, however, is met with in the principles of pathology itself, inasmuch as it is contrary to our existing notions on the subject that normal tissue or tissues that had undergone only "slight colloid degeneration," should penetrate through the intact wall of an otherwise normal larynx or trachea. In two or three cases there was not even a goitrous enlargement in the neck and in the others the enlargement is expressly stated as but slight.

We ought to mention here, before taking up the subject of malignant growths of the thyroid, that Schnitzler and Chiari have described cases of so-called retropharyngeal struma or goitre, which have sometimes, as in one of the cases of Chiari, extended across the upper part of the larynx, suggesting the possibility of like origin in the case here reported.

But outside of the fact that the growths consisted of normal thyroid tissue, they were further distinguished by the presence of a large prominent tumor in the pharynx, of which there was no sign in my patient.

Of cases of malignant tumors of the thyroid gland penetrating the larynx or trachea, I have found mention, as above-stated, of less than a dozen in the literature, although it seems likely that many more than that have not been recorded, or the references thereto have escaped my search.

The first case that I have seen recorded, is that of Chassaignac (Gaz. des hop. Par. 1849, 3, s. i, 488), who, in 1849, related the history of a patient with cancerous growth that was prolonged both into the esophagus and trachea, and caused death by suffocation.

In 1868, Williams (Tr. Path. Soc. Lond., 1868–9, XX, 394–7) described the results of a necropsy, on a patient aged 67, who died with symptoms of dyspnea and dysphagia. On the posterior wall of trachea was found a warty excrescence about an inch in length, continuous with the thyroid gland, which was enlarged. The main thyroid was not examined microscopically, but the intratracheal growth, as a result of such examination, was pronounced malignant. The description given seems to indicate that it was a sarcoma, rather than carcinoma.

Langlet (Bull. soc. med. de Reims, 1876–7, XV, 98) in 1876 reported a case of cancerous growth protruding into the trachea, and Ballet (Bull. soc. anat. de Paris, 1878, LIII, 116–118) a similar case in 1878.

Heath (Med. Times & Gaz. Lond., 1879, II, 663) reported in the year following a spindle celled sarcoma involving the larynx and ending fatally, and in 1887 we have an interesting report of a case of intra-tracheal carcinoma continuous with the thyroid gland given by Semon and Shattock (Trans. Path. Soc. Lond. 1887–8, XXXIX, 42-47).

Guido Banti (Arch. di anat. norm. e patol. Firenze, 1889–90, V., 131–142) gives us in 1889 a lengthy description of necropsy upon a man of 62, with cancer of thyroid body involving the trachea and with secondary deposits in the bronchi. Both external and internal growths had a histologic character, which was pronounced to be that of an aveolar carcinoma.

Wolfenden (Jour. of Laryng. Lond., 1890, II, p. 50) in 1890 reported a case of squamous epithelioma of thyroid invading the larynx. Tracheotomy was performed without relief to the dyspnea, due, as was discovered post mortem, to compression of the trachea by the enlarged thyroid below the tracheal opening.

In 1891 we have the report of another carcinoma of thyroid with involvement of the larynx, by Baginsky (Veröffentl. d. Hufeland. Gesellsch. in Berl., 1891–2 and 86–91).

Guion and Bufnoir (Bull. et mem. Soc. méd. de Hop. de Par., 1898, 3 s. XXV. 253) report in 1898 a carcinoma of thyroid with indolent vegetations in the trachea in a woman of but 32 years of age. who died rather suddenly of suffocation.

Finally Bosworth of New York wrote me in 1900 that he had had one such case occurring in a man of 40, in which he had to perform one of the most difficult tracheotomies he had ever done in his life.

To these cases let me add only that reported by Meyer (Archiv. f. laryngol. u rhinol. Berlin, 1896, XXVI, 389). which possessed certain clinical features of malignancy, but which histologically was almost completely of the type of a simple colloid goitre.

It occurred in a woman of 52 years, with large swelling on outside of neck, who died of suffocation due to the presence of a thyroid tumor filling up the trachea at about the 4th or 5th ring. The patient had been under observation nearly four years, and it was only during the last year that there was any marked increase in growth. Meyer was in doubt as to the true nature of the tumor, but called it, as a compromise, malignant adenoma; in favor of the malignancy were the destruction of the tracheal cartilage and metastases which were present in some of the regional lymph glands.

In fact the absence of decisive and definite lines of demarcation between malignant and benign tumors of the thyroid gland is a peculiarity in their pathology which has often been remarked.

While, on the one hand, we find Cohnheim (Arch. f. path. Anat., etc., Berlin, 1876, LXVIII, 547) talking about metastases from simple colloid goitres; on the other we find instances of cases of carcinoma of long standing and showing less than the usual signs of malignancy; as, for example, a case recently reported by Hobbes and Begouin (Rev. internat. de rhinol., otol,, et laryng. Paris, 1898, IX, 261) of an epithelioma of the thyroid in a woman of 38, that had been present for sixteen years, and which was known at least for the last six years not to have increased at all in size.

Wölfler (Ueber die Entwickelung und den Bau des Kropfes, Berlin, 1883), who has written very extensively on this subject, and is generally referred to as an authority on the pathology of the thyroid gland, has strongly emphasized the difficulty of drawing hard and fast lines of distinction between the different classes of thyroid tumors.

He says in one place, for example (page 39), that so many transitional forms exist between adenoma and sarcoma, and more especially between adenoma and carcinoma, that we find we cannot state their boundaries, and have been obliged therefore to employ the term malignant adenoma to refer to certain tumors that do not come exactly under one head or the other.

Again, in another place (page 130), he says, we have to acknowledge that between papillary cystadenoma and papillary carcinoma, no essential distinction can be made; but rather a gradual difference manifested in the size and shape of the epethelium, in the distribution of the stroma and in the growth of the gland follicles.

Returning to the microscopic examination, of which we have given a full account above, we find several features which, taken together, speak so strongly in favor of the carcinomatous nature of the laryngeal part of the growth in my case, that I hardly see how we can fail to accept the diagnosis. They are (1) the irregularity of the cells varying, as stated, from cubical to columnar, (2) the fact that the cells were several layers in thickness, (3) the existence of an extensive papillary formation, the papillæ sometimes breaking through the alveolar walls, (4) the infiltration of the surrounding tissue and (5) the absence of a definite limiting connective tissue capsule.

Yet, as we have already above insisted and pointed out as an interesting feature of my case, the clinical aspects do not bear out the diagnosis of malignancy. In harmony with such diagnosis are only the facts (1) that we had to deal with a tumor, apparently for a long time quiescent, which finally began to grow, (2) the rapidity of the growth and (3) the prompt reformation after removal.

But on the other hand we have to oppose to the idea of malignancy, certain very forcible arguments, the chief of which is the continued absence of any signs of cachexia and the generally healthy and well nourished condition of the patient nearly three years after she was first under observation, the fact that pain was never a prominent symptom, and the general failure of any evidence of metastases.

In closing, I will only call attention to the apparent efficacy of galatin in this case in controlling the hemorrhage. The history of the patient, previous to coming under my care, was almost enough to suggest the appelation of hemophilia. She had had two very alarming hemorrhages in connection with certain abdominal operations, and during the first part of the time she was under my observation, was subject to most obstinate hemorrhages from the simplest manipulations in the larynx.

Under the local application of gelatin, I found that I might operate with impunity, and without daring to draw any inferences from this single experiences, I found further, that after the gelatin application had been used a number of times, the hemorrhage from operation became less and less, until finally it was no longer, as it had formerly been, a very considerable or serious feature of the case.

XXXVIII.

REPORT OF AN ACCIDENT WITH A TRACHEOTOMY TUBE.*

By Charles N. Cox., M. D.

BROOKLYN–NEW YORK.

L. T., female, age four years, multiple papillomata of the larynx. The child had been suffering from progressive difficulty of phonation and respiration for about two years. About four months before the writer saw her, she had been intubated for suddenly increased embarrassment of respiration, and had worn the tube for a number of days.

I did a low tracheotomy upon her, at the Bushwick Hospital, January 17th, 1899, a few days after she came under my care. At that time and for a long time previous, she was completely aphonic; respiration was very labored, her body was emaciated and her general condition bad. The larynx was literally filled with papillomata; so much so that they could be seen by direct inspection projecting above the epiglottis, upon depressing the tongue. About one week later the little patient was brought under chloroform anesthesia, through the tracheotomy tube, and laryngo-fissure performed. The larnyx seemed very small, even for a four year old child, and it was far from easy to recognize the topography of the interior of the larynx during the process of removing the growths. After their removal, the thyroid cartilages were united with sutures; likewise the skin down to the tracheotomy tube. Primary union was secured.

The child was never able to breathe entirely without the tube, and recurrence rapidly took place; although her general condition improved greatly, owing to the improved oxygenation obtained by means of the tube, which she tolerated well. Her mother became quite an expert in the care of the tube, so that it was not necessary to see the patient more than about once a month, to keep track of the condition of the tube, which was a solid silver one. Everything went along nicely for about two years. The child grew and was, generally speaking, quite healthy and active.

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*Read before the American Laryngological, Rhinological and Otological Society, at Washington, D. C., June 2-4, 1902.

October 19th, 1900, I was hastily summoned to the house and informed that the tube had broken off and part of it was still in the windpipe. I found the little patient breathing easily through the tracheal wound. The mother informed me that upon attempting to remove the inner tube, part of the outer tube had come along with it; but that a part of each tube had been left behind; that respiration was somewhat embarrassed for a few minutes; then, following a fit of coughing, the remainder of the inner tube had been expelled; but that the inner end of the outer tube still remained.

The piece that was coughed out was about three-fourths of an inch in length. The piece of the outer tube that remained was, consequently about the same length, or little longer, since the break was in the same location in both tubes.

Upon consultation, both the family physician, who was already present, and I made out what we considered were unmistakable signs of a foreign body in the right lung at about what we thought might be one of the first divisions of the right bronchus. Chloroform anesthesia was now induced, and careful search was made for the missing piece of tube, with probe and forceps, through the tracheal wound. The effort was fruitless, save that I fancied I perceived metal contact once or twice. The child was then, at my suggestion, taken to the Bushwick Hospital. Dr. A. T. Bristow, of the consulting staff, kindly saw the case with me. He and one or two other gentlemen, independently and without suggestion, elicited the physical signs of a foreign body at the same location previously noted by the family physician and myself. At my request Dr. Bristow made a further attempt to reach the recreant piece of tube through the trachea. After repeated and somewhat prolonged efforts, the attempt was given up as futile. The condition of the patient and the circumstances of the case did not warrant an operation through the chest-wall.

The prognosis seemed most unfavorable, indeed. The mother was informed of the hopelessness of the case, and was told that the little one would probably die in a few days of traumatic pneumonia. Not an unfavorable symptom followed—not even a rise of temperature. After two weeks of observation, a new tracheotomy tube in the meanwhile having been inserted, the patient was discharged.

About two weeks later, the child coughed up the missing piece of tube, and brought it out through the mouth. It was lain aside to be shown to me but unfortunately it was lost before the mother had an opportunity to bring it to the office.

For awhile preceding the accident, the mother had been somewhat remiss in the matter of bringing the child to me for inspection. I had not seen her for a couple of months or so. When last seen the tube was sound, bright and apparently in perfect condition.

She always has a tube in reserve now, and puts a new one in, herself, every three months.

XXXIX.

A PHYSIOLOGIC STATEMENT EXPLANATORY OF SOME OF THE SYMPTOMS OF MOUTH-BREATHING.*

By William Lincoln Ballenger, M. D.,

CHICAGO, ILL.

In 1896 while examining microscopic sections of the lungs of guinea pigs, which had been confined in an atmosphere laden with a mixture of starch powder and nitrate of silver, I was struck with the arrangement of the endothelial lining of the air vesicles. In the normal lung this lining is but one layer in thickness. In these specimens it was often two, seven, and in some places twelve layers in thickness.

This observation led me to the construction of an hypothesis explanatory of some of the symptoms of mouth-breathing. It occurred to me that perhaps in mouth-breathers there was a change, possibly a swelling or thickening, of the lining of the air vesicles, and that this would, in some measure, give rise to an interference with the interchange of gases through the walls of the air vesicles, thereby causing an auto-intoxication, which is expressed clinically in mouth-breathers.

The recent observations of Mendel, "Tracheal Injections,1901," shows the tremendous absorptive capacity of the tracheal and bronchial mucosa for fluids and oxygenated water. He claims that there is no other mucous membrane better adapted for this purpose. The whole trachea and bronchial surfaces are lined with a single layer of columnar ciliated epithelium, beneath which there is a rich capillary net work of blood vessels. His experiments and clinical observations go to show that not only are oxygenated water and various other liquids tolerated, but that they are absorbed in large quantities when injected into the trachea. He cites the experiments of Colin wherein about two liters of water were injected into the trachea of a horse in the course of twenty-four hours without untoward result. This all points to the fact that not only are the air vesicles so constructed as to favor the physiologic absorption of gaseous media, but that the tracheal and bronchial lining absorb fluid and gaseous media in large quantities.

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*Read before the American Laryngological, Rhinological and Otological Association in Washington, D. C., June, 1902.

In brief, it has occurred to me that the loss of the nasal respiratory functions results in certain changes in the air vesicles and tracheal and bronchial lining, thereby interfering with the normal interchange of gases (oxygen and carbon dioxid) in the lower respiratory tract.

Whatever the changes in the lining of the air vesicles may be, it seems rational to hypothecate that it modifies the osmosis of gases and thereby gives rise to alterations in the metabolic processes, or nutritional activities which are finally expressed in the nervous and developmental symptoms so characteristic of mouth breathers.

We do not overlook other factors which undoubtedly contribute to the results embraced in this clinical picture. The presence of the pharyngeal tonsil is usually attended by suppurative nasopharyngitis. More or less of the septic material is absorbed into the circulation, and without doubt contributes to the clinical phenomena under discussion. Nor do we overlook the important anatomic connection which Axel, Key and Retzius have shown to exist, at least in the lower animals, between the nasopharynx and cranial cavity. The lymphatic connection between the nasopharynx and cranial cavity, which they have demonstrated, may, in part, explain some of the nervous and mental signs of mouth-breathing. The absorption of the toxic material from the naso-pharynx may be carried to the brain and produce nervous and mental phenomena, as aprosexia, peevishness, etc., or the obstruction to the lymph channels may give rise to the same phenomena.

In addition to these and other causes, I wish to call attention to the role played by the lower respiratory tract, and more particularly by the air vesicles.

My views are epitomized in the following:

The term "mouth-breathing" implies the absence of "nasal respiration." In other words, the respiratory functions of the nose are lost to the physical economy.

The respiratory functions are: (a) to warm or cool; (b) to moisten; (c) to filter the inspired air. McDonald has clearly demonstrated that air passing through the nasal chambers is either lowered or raised to almost the body temperature. The trachea and bronchi are supplied with but few glands and secrete but little moisture. The erectile and serous glands of the turbinated bodies throw out approximately sixteen ounces of serum in twenty-four hours. The warm and expanded air in the nasal chambers absorbs a greater portion of it, and it is thus carried to the lower air-tract, where it is needed for physiologic purposes.

When the temperature of the air is elevated its capacity to absorb moisture is greatly increased. This has an important bearing upon the question in consideration. The air is elevated in temperature in its passage through the upper respiratory tract, hence its absorptive capacity is increased. In mouth-breathers, failing to receive its full capacity of moisture from the nose, it abstracts it, therefore, from the air-tract below. Some have held that the moisture taken up in the nose is to be deposited in the bronchi and air-cells of the lungs, which are but sparsely supplied with mucous and serous glands. This is questionable if taken as a statement of the entire truth. Undoubtedly this is one of the purposes. Another purpose is to so charge the inspired air with moisture that when it reaches the lower air-tract it will not absorb the moisture which is there for physiologic purposes.

The nasal chambers are so constructed that the column of inspired air is thrown into whirls, and comes in contact with the moist Schneiderian membrane, where the dust, germs, etc., are deposited. The air is thereby partially filtered, and enters the lower air-tract comparatively free from obnoxious foreign particles.

As a consequence of the impairment, or loss of nasal respiration, the inspired air passes into the lower air-tract insufficiently tempered, moistened, and filtered. The mouth and pharynx but feebly perform the respiratory functions of the nose. The mucous membrane of the larynx, trachea and bronchi is therefore irritated. The epithelial cells lining the air vesicles (of which there is but a single layer) become irritated also.

I have not yet had the opportunity of demonstrating by postmortem examination the exact nature of the pathologic changes which take place in the lower air-tract of mouth-breathers, but I do not doubt that they occur, and that the capacity of the air vesicles to transmit oxygen to the blood and carbon dioxid from the blood is thereby impaired. That these changes are so pronounced, or are of the character of those observed by me in the lungs of guinea pigs is not claimed; it is only suggested that it seems probable that the loss of the respiratory function in the nose results in certain changes in the respiratory apparatus of the lungs, which impairs their capacity to carry on the interchange of gases. This may consist in the diminished osmotic property of the vesicle walls on account of the lessened amount of moisture, or it may be due to some tissue change in the vesicle walls themselves.

Thickened epithelial lining of air-vesicles. Because of these changes a deficient amount of oxygen is absorbed by the blood. Faulty oxygenation of the tissues or faulty metabolism results. The half-way products of oxygenation, as uric acid, etc., are freely formed and circulate through the system. Another effect is the retardation of the elimination of carbonic acid gas. In other words, carbon dioxid is accumulated in excess in the blood. When in excess it acts as a violent poison to the leucocytes, thereby impairing their function.

Function of the leucocytes impaired. We as yet know but little of the part played by the leucocytes, but we may, however, name the germicidal and scavengerial properties as among the fairly well established functions of these corpuscles.

Physical malformations and nervous phenomena. If we but recall the physiologic disturbances following irritation of the epithelial lining of the air vesicles, it becomes apparent that physical malformations and nervous symptoms must of necessity largely make up the clinical picture of mouth-breathing. Deficient oxygenation of the red blood corpuscles leads to imperfect metabolism. The nutritional processes are impaired, and there is a lack of co-ordination in the developmental processes. Physical imperfection, or malformation results. Excess of carbon dioxid leads to the impairment of the scavengerial functions of the white blood corpuscles. The products of faulty metabolism, if allowed to accumulate in the blood and lymph fluid are toxic, or irritating to the nervous and other structures of the body. Their functions are disturbed, and manifested clinically in such signs as peevishness, inattention, aprosexia, restlessness in bed, enuresis, quick temper, etc.

The scavengerial function of the leucocytes being impaired, there is an accumulating of irritating subtances in the blood, which in turn cause peevishness, inattention, restless nights and quick temper. The impairment of the leucocytal function renders the patient an easy prey to microbic infection, and augments the nervous symptoms just enumerated.

Recapitulation. 1. The respiratory fuctions of the nose are to warm (or cool), moisten and filter the inspired air.

2. In mouth-breathers this function is absent or impaired.

3. The lower air-tract is incapable of supplying the requisite amount of moisture, hence the air vesicles and bronchi are abnormally dry.

4. This irritation cuuses certain pathologic changes in the air vesicles, which impairs their capacity to absorb oxygen and throw off carbon dioxid.

5. Deficient oxygenation of the blood results in the toxic products being thrown off into the circulation.

6. The "half-way" products are toxic and cause nervous phenomena and malnutrition.

7. The malnutrition leads to physical imperfection or malformation.

8. Excessive accumulation of carbon dioxid in the blood impairs the function of the leucocytes and other cellular structures.

9. The products of faulty metabolism (half-way products) are not removed from the circulation by the crippled leucocytes. The nervous phonomena are thereby still further increased by their presence.

The foregoing train of occurrences may be observed in children who are mouth-breathers, whether it be due to postnasal adenoids or to other forms of nasal obstruction.

100 State street.

XL.

THE SURGEON'S DUTY TO CHRONIC OTORRHEAL PATIENTS.*

B. F. Church, M. D.,

LOS ANGELES, CAL.

That chronic otitis media, especially when accompanied by purulent discharge, constantly imperils life, is well known by all aural surgeons. This risk to life by danger of the passage of infective material to the cranial cavity, in all cases of suppurative processes of the middle ear, so well understood by the surgeon, is, as a rule, looked upon lightly by the patient. It is not unusual to find those who consider their otorrhea one of Nature's mysterious, yet beneficent methods of ridding the system of some materies morbi which it is otherwise unable to cope with. The writer claims that the patient has an inherent right to know, as well as he may, the true condition of affairs and the dangers that lurk in his apparently harmless discharging ear.

By impressing the patient with the importance of the attention that his condition demands he will better care for himself. Not only so, but the surgeon's responsibility ceases, when the patient refuses radical procedure after being advised of the existing danger should the fatal termination supervene. As we all know, no set of rules can be laid down to guide us in every case when or when not to operate. A fatal result may supervene when quite unexpected. After exposure to cold, a blow on the head, or an attack of naso-pharyngeal catarrh dormant pathologic processes in the middle ear may suddenly become acute. The ominous symptoms of severe pain in head, rigors, fever, delirium, convulsions and coma indicate too plainly the course the disease has taken and the catastrophe which is almost sure to follow.

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*Read before the Western Section of the American Laryngological, Rhinological and Atological Society, April 3d, 1902.

Persons suffering from chronic suppuration of the middle ear may be a source of danger to others. Hovell* reports a case of a medical practitioner who had this affection and transmitted puerperal fever to several women whom he attended during their confinement and was compelled to give up his obstetrical practice on account of it. It is probable that the mastoid cells are more frequently affected in middle ear suppuration than is generally supposed. Bezold states that nine per cent. of all cases of acute middle ear suppuration are accompanied by mastoid suppuration to such an extent as to make spontaneous recovery improbable. Tubercular patients of this character are especially liable to the formation of cholesteatomatous masses in the tympanum.

Any impediment to the free escape of secretions from the middle ear favors mastoid involvement. Such impediments in the form of contracted meatus, polypi, granulations and membranous bands across the tympanum are by no means infrequent.

Retention of secretion is also likely to occur when the perforation is small and situated in the upper portion of the drum membrane. The anatomic arrangement of this part of the tympanum, known as the attic, accounts for the greater danger of extensions of disease when located there than if lower down. A fold of mucous membrane extends across the cavity from the short process of the malleus and almost completely divides the attic from the lower part of the tympanum. Reduplications of this membrane, or great swelling of the parts, may completely separate the two portions of the cavity. As the attic extends somewhat over the superior wall of the meatus, a very small space is left for the external discharge of inflammatory products which must pass either under the posterior-superior lip of the bony canal or through Shrapnell's membrane.

In cases of tuberculosis, influenza, scarlatina and syphilis, there is a special tendency toward the implication of the mastoid cells.

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*Diseases of the Ear, by T. Mark Hovell, 1901.

Recent investigations have shown that the spread of the process is mainly due to the action of micro-organisms (streptococci and diplococci). Microscopic examination should therefore be made of the secretions in all acute and chronic cases of tympanic suppuration. The presence or absence of pathogenic organisms in the discharge will greatly aid in prognosis of a given case.

A review of the anatomic conditions which facilitate the extension of pathogenic processes from the tympanum may not be amiss.

In a large per cent. of cases septic infection spreads by direct contact. A portion of the osseous wall of the tympanum being carious, perforation takes place, leading to or beyond the dura mater. These carious points are usually located in the roof of the tympanum, roof of mastoid antrum, and groove of the sigmoid sinus. An entirely different class of cases are those in which extension takes place in absence of caries or when the bony lesion does not extend through to the dura mater. These may be called anatomic, as infection takes place through anatomic or natural openings. The avenues of infection are 4 or more in number. (1) Gaps or dehiscences in the bone; (2) along prolongations of the dura mater; (3) through the labyrinth, after destruction of the tissue, covering the fenestrae; (4) through minute veins, in which thrombosis takes place, and extends from these to the nearest sinus (Hovell). Physiologic or natural openings from the tympanic cavity through which infective material could pass to vital parts may be found in the roof, floor, anterior wall, the posterior and inner wall of the cavity.

Infection from the roof of the tympanum may take place through the petro-squamous fissure, which often exists in children. Through this fissure, a process of the dura mater, containing many small vessels, passes down into the tympanum. This plate of bone, which forms the floor of the middle cerebral fossa, is very thin and often contains small openings. This bone is also very liable to be the seat of caries.

The floor of the tympanum. The floor of the tympanum forms the roof of the jugular fossa and sometimes contains dehiscences through which infective material may pass to the vessel, with thrombosis or ulceration of that structure.

The anterior wall of the tympanum lies close to the internal carotid artery. Its walls are sometimes extremely thin and present several small openings. Besides these openings a few minute branches of this artery pass into the tympanum.

The posterior tympanic wall contains several openings leading to the mastoid antrum and cells, through which infective material may very easily pass. The structure of this part accounts for the occurrence of sinus thrombosis and abscess of the cerebellum which so frequently follows middle ear suppuration.

The eminentia pyramidalis, also in this region, contains an aperture through which infective material may pass into the Fallopian aqueduct and thence to the internal meatus. Through this opening passes the stapedius muscle and small nerve.

Inner wall. There are several pathways through which infective material may pass through the inner wall of the tympanum, more especially, however, after carious or operative destruction of their structual coverings. The passage may, after destruction of its membrane, be through the fenestra rotunda or through the fenestra ovalis after detachment of the stapes. In caries of the upper and posterior part of this wall the external semicircular canals may be exposed. Other routes are furnished by the aquaeductus cochleae and the aquaeductus vestibuli. Minute gaps also sometimes exist in the wall of the Fallopian aqueduct, which leads to the internal meatus, and larger openings may result from caries.

Statistics do not enable us to arrive at the exact per cent. of cases of chronic middle ear suppuration that suffer acute exacerbation with cranial involvement. The proportion, however, is much greater than is generally supposed. The prognosis after extension of the disease is always grave and operative procedures are more exacting than in primary acute cases.

The following cases from the writer's practice illustrate the insidious and dangerous nature of the disease under consideration.

Case I. Man, 35 years of age. Robust health. Had purulent discharge from ear from time to time for 20 years. He never suffered pain from ear and was only annoyed by the somewhat copious discharge from ear, being worse when he had a cold. There was a large perforation in the lower quadrant of the drum membrane which gave exit to the discharges. The discharge was odorless and had the appearance of mucus. Eustachian tube freely open. He was treated regularly for more than a year by every known method, save operative, to no avail more than to sometimes check the flow for a short time. During all of this period he suffered no pain nor could tenderness be elicited by firm pressure over any part of the temporal bone.

While visiting the country he was suddenly attacked by severe pain in his ear. I found upon the next day some tenderness upon pressure over the antrum and a slight rise of temperature. The pains increased and upon the third night the patient was partly delirious.

The Stacke-Schwartze operation revealed the antrum filled with pus and granulation tissue and mastoid cells entirely to the tip filled with pus. The cells and necrosed bone back of the lateral sinus were removed, also performed complete exenteration of the tympanum. Considerable carious bone was found in the roof of the tympanum.

There had evidently been no extension to the cranium as the patient made an uneventful recovery.

Case II. Man, 38 years of age. Facial paralysis of several years standing. Came to office for the relief of a severe pain in ear on side of paralysis. Found the meatus partly filled with offensive inspissated pus. Small opening through Shrapnell's membrane. The patient gave a very indefinite history of having had ear trouble several years before, but since that time had not thought it of enough importance to give the ear any attention.

Upon the third day from his inception of pain the radical operation was performed. Large cholesteatomatous masses with pus were found in the middle ear and antrum. Walls of the typanum were denuded of mucous membrane in several places, but no direct track could be detected by which the infective material had passed to the brain or elsewhere.

The operation performed was the Stacke-Schwartze. The patient continued to complain of severe pain radiating over the whole side of the head. Upon the third or fourth day (after operation) it was noticed that his facial paralysis had passed away. Pressure made by the cholesteatomatous mass upon the facial nerve at point of passage through the tympanum had doubtless caused the paralysis.

Symptoms of brain irritation soon developed but not sufficiently marked to locate the brain lesion. The continuance of pain and mental hebitude prompted a second operation on the sixth or seventh day. Purulent meningitis and cerebellar abscess were found. The patient soon passed into a state of coma and death.

This case was, in all probability, one of direct contact, infection taking place through the roof of the tympanum or antrum at the onset of his illness.

Case III. May 24. History of tuberculosis several years ago but had apparently entirely recovered and presented a healthy, robust appearance. Had chronic disease of the ear for several years. Very slight discharge at any time and none at all for periods of several months. Complained of a feeling of pressure and uneasiness in affected ear. Objectively, canal small. Drum membrane reddened and a small perforation in the upper posterior part. No tenderness upon deep pressure over the antrum or cells. The patient being intelligent, his condition was fully explained to him and operative procedures advised, either through the meatus or mastoid. He readily consented to an operation and favored the radical one.

Three or four days before the time set for the operation he came to me suffering great pain in ear and temporal region with slight elevation of temperature, which came on suddenly the night before, without any apparent cause more than a slight cold.

The radical operation revealed the middle ear and antrum filled with granulation tissue and pus. Mastoid sclerosed. Every portion of diseased tissue that could be found was traced out and removed. The patient's temperature dropped to nearly normal in a few hours after the operation, but excruciating pain continued over the whole of the temporal region extending into the eye of the affected side. The pain continued in severity with a temperature not above 101 1/2 to the sixth day after the operation, when the patient became drowsy and in a state of hebetude. Ocular examination proved negative as a means to diagnose the existence of brain lesion, as did also a most searching examination of the reflexes by Dr. H. G. Brainard.

At the beginning of the comatose state of the patient, the dura mater was laid bare over the middle fossa and a sterilized needle introduced in all directions in search of an abscess, though none was found. Autopsy showed great hyperemia of the meninges over nearly the entire left hemisphere of the brain, and a softened area the size of a silver dollar near the cortex in the temporal region.

There were no adhesions of the dura to the bone or localized inflammatory spots at any point to indicate the place through which infection passed

This case is one in which infection took place in all probability through some of the natural channels.

Indications point very strongly to the belief that both of these lives could have been saved had operative procedures been resorted to before the onset of the acute exacerbation of the smouldering disease.

Just when the time arrives for the surgeon to step in and lift this Damoclean sword, ever suspended over these patients no ancient or modern disciple of Esculapius has been able to determine.

XLI.

THE TREATMENT OF LARYNGEAL PAPILLOMATA WITH REPORT OF A CASE.

By Dunbar Roy, A. B., M. D.,

ATLANTA.

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The etiology and treatment of laryngeal neoplasms is still a very mooted question among laryngologists. Clinical observations have afforded so many diverse opinions in regard to these growths, that each one must as yet be a law unto itself. Anomalous conditions, both in appearence and disappearance, are liable to be seen in every case coming under the care of the laryngologist.

Malignant neoplasms of the larynx are fortunately much less frequent than those of a benign character. Of these latter, laryngeal polypi or papillomata are by far the most frequent, constituting according to statistics more than half of all benign laryngeal growths.

Our ideas in regard to both etiology and treatment of laryngeal papillomata have not materially changed since the appearance of the well known works of Czermak, Turk, Von Bruns, Mackenzie and Mandl.

While the etiology of these growths is still disputed, most observers recognize the prominent part played by a chronic congestion and a so-called catarrhal state of this organ. Bosworth believes that many of these growths arise from a perfectly healthy membrane without a previous catarrhal condition.

Chronic congestion of the larynx, as produced from excessive use of the voice, or from that of tobacco and alcohol, especially the latter, have in my experience been important factors in producing these neoplasms. However there are many other causes, since the growths are limited to no age of the individual and in fact some have been reported as congenital in character.

Here again there is a difference of opinion among observers as to the age at which these growths most frequently occur.

Tobold in his work, says that papillomata are most common in middle life, from the thirtieth to the sixtieth year. Dr. Casuit in article on the same subject, declares that they most frequently occur in early infancy. Mackenzie says that his experience leads him to consider the middle period of life as the most favorable to the development of these growths, a view also held by Lennox Browne. Shurly does not consider one age more liable than another.

Papillomata occurring in adult life and those occurring in childhood and infancy certainly differ as to the etiology of their production. In some cases it is evident that the laryngeal membrane has some inherent tendency to proliferate and form these growths, but the reason for this cannot be clearly demonstrated. My own opinion coincides in a great degree with those of Gerow and Fauvel who believe that "a papilloma is not a tumor but a proliferation of the mucous membrane." Here is a public speaker who drinks freely and smokes inordinately. His whole respiratory membrane is kept in a constant state of congestion. Soon he begins to suffer with hoarseness and on examination we find a small papilloma close to the edge of the vocal cords. To our clinical mind, the etiology of this neoplasm is evident. Here is a small patient, eight years old, who suddenly becomes hoarse without any previous noticeable laryngeal trouble. On examination we find one or two excrescences of a papillomatous character just at the free edge of the vocal band.

The two growths are considered histologically the same and yet the cause of each must be different.

A good many observers, among them Lennox Browne, would seem to think that these neoplasms bear some relation to adenoids in the naso-pharynx, because in some instances the two growths are found simultaneously.

Here again individual observation plays a prominent part, since many excellent clinicians have never noted such a relationship. This latter has been my own experience and I notice it is the view held by Dr. Shurly in his late text-book.

The question of a tubercular or syphilitic diathesis opens up in my mind a broad field for investigation, notwithstanding that so eminent an authority as Morell Mackenzie says "neither syphilis nor phthisis nor any other constitutional condition appears to favor these growths." I have seen a few cases of syphilitic excrescences on the vocal cords in negroes disappear entirely under the use of the iodids. Is it not possible for such excrescences to take on the character of true papilloma? I see no reason why, if we may accept the fact of an occasional transformation of a benign into a malignant neoplasm, and also the fact of recurrences at the point of removal, as have been frequently reported, we may not also accept the possibility of a cell proliferation as a result of a systemic dyscrasia.

In fact the old writers upon tumors, attributed the etiology of such to some blood dyscrasia which they supposed caused a cell proliferation in some portions of the body. Even to-day the pathology of tumor formation is a matter of dispute.

Virchow believes that there is always an external irritant while Cohnheim considers the non-development of some of the germinal layers the chief factors in tumor formation.

There remains much yet to be done if we may know with certainty the pathology of tumors in various parts of the body and papillomata of the larynx in particular.

For many years after the introduction of laryngoscopy, the mode of treatment by the endolaryngeal extirpation was pretty universally accepted, but in the last few years laryngologists have become divided in their views as to the best management of these laryngeal neoplasms.

The various cutting and pinching forceps, snares and knives which have so aided the laryngologist in the quick and safe removal of these growths, have certainly added to the popularity of this mode of treatment. But clinical observers have begun to note, after the surgical removal of these growths, in many cases, especially in the young, that there is frequently a tendency for these growths to return with startling activity. While denied by many, the few authentic cases reported, certainly warrant us in considering the possibility of the transformation of a benign into a malignant neoplasm. The more extended becomes my clinical experience, the more I am convinced of the fact that laryngo-rhinologists of to-day are too prone to active surgical intervention in cases which should have received more consideration at the hands of conservatism.

In the treatment of laryngeal papillomata, my experience leads me to conclude that the method pursued must in a great measure vary according to the age of the patient.

We may divide the present methods of treatment into: (1), Chemical; (2), Endolaryngeal by surgical means; (3), By external operation, such as tracheotomy, thyrotomy, etc.

1. I believe it is to Dr. Delavan more than to any one else that the method of treating these growths by spraying the larynx with alcohol has been brought prominently before the profession.

Personally I have been very much impressed with this method and have used it with satisfaction in several cases.

When we remember that there are many patients who will not submit to having a small growth removed by any instrument in their larynx, and that there are others whose larynx is so irritable as to preclude all possibility of surgical intervention, it is indeed a source of satisfaction to be able to use a gentler method and at the same time frequently just as efficacious. Especially is this true when we have a case of laryngeal papilloma in a very young subject.

To attempt the endo-laryngeal removal of a papilloma by surgical means in the very young, is an exceedingly difficult proposition in the first place and in the second the results have been anything but encouraging.

In fact I believe that such a radical procedure in children is not warranted except as a last resort and even then it is questionable. It is a recognized fact that these growths have a progressive and regressive stage, especially noticeable in children.

A recent case under my own observation is of interest at this point, showing as it does the value of unintentional conservative treatment. Mary M., colored, aged 9, was brought by her mother to my clinic in May, 1901, on account of a hoarseness and difficulty in breathing at night. A strong, well nourished child was seen with no signs or history of any blood dyscrasia. The nose, nasopharynx and pharynx appeared normal. By laryngoscopic examination, a papillomatous growth was seen on phonation to spring from just beneath the free edge of the left vocal cord, anteriorly. It had the typical appearance of a papilloma, freely movable and about the size of a small raspberry. I commenced immediately to educate the larynx with instrumental manipulations, preparatory for its removal with forceps or snare. This was continued for two or three weeks, the larynx being mopped out each time with cocain solution. Just as soon as the forceps were introduced, spasm of the larynx took place and nothing was accomplished. Finally the obstruction to breathing becoming so bad at night, I made preparations for putting the patient in the hospital and doing a thyrotomy.

Just at this time I was compelled to leave the city and the day after my return being compelled myself to be operated upon for appendicitis, I did not again visit my clinic until the following September.

On asking my assistants what had become of the case, they informed me they had not seen her for a month. That during my absence her symptoms had grown better and they had continued to make applications of cocain without any further treatment. Meeting the patient on the street in October, I asked how she was getting along. Much to my surprise she replied in a clear voice that she was all right. Later I made a laryngoscopic examination with the result that not a vestige of the growth remained to be seen.

Here is a case similar to those reported as of spontaneous disappearance, for it is hard to conceive of any curative effect of cocain applications. Possibly the astringent effect of the cocain may have had some value.

Laryngeal papillomata in children show many changes which are not seen in those occurring in adults and for this reason the treatment must vary. In adults, the removal of these growths by endolaryngeal surgical methods, is usually attended with permanent success, while in children, experience has shown that a recurrence is more than likely to follow.

I am firmly convinced that the so-called palliative treatment in children, and even with adults except in unusual cases, would be very much more successful in final results than the more radical measures. Dr. Massei of Naples, in an article published in 1893, has called attention to the fact that a regressive stage usually follows a progressive one after a certain time and this fact should merit attention both as to our knowledge of the nature of these growths and also their treatment.

I believe that cases of laryngeal paillomata in patients of all ages should be kept under observation for some time and topical medication applied before adopting any endo- or extra-laryngeal surgical procedure. The views expressed by Lennox Browne agree with my own clinical experience.

He says "The number of people, to whom the advice to watch and wait is given, must be very small; but without doubt, there are a very large proportion of cases which never require treatment, and if left to themselves never assume a serious aspect. There is no reason to doubt that while many of these formations remain stagnant, a large proportion would, on no less authority than Virchow, if untreated frequently disappear spontaneously, being subject as they are to slow atrophy and absorption."

The endolaryngeal removal of these growths in children, has been almost universally unsuccessful in the final result. If we will examine the literature on this one point, we will see the truth of the assertion. In a number of cases reported, it has been seen that not only was there a rapid return of the growth, but they increased frequently in size and in a short time the patient was in a very much worse condition than before the operation.

It may look brilliant to remove a growth per vias naturales in a child, but the result certainly does not justify the means, even if we leave out of consideration the by no means remote possibility of injuring other portions of the larynx.

What is true in regard to the unsatisfactory results in the removal of these growths by the endolaryngeal method is even truer of the method of removal by thyrotomy and tracheo-thyrotomy. Very naturally this latter operation is much more serious and is not attempted except as a last resort.

Mackenzie has well expressed a conservative view when he says: "Laryngotomy is only justifiable when an experienced laryngoscopist has declared the removal of the growth per vias naturales impossible."

If then we have an equal chance of curing laryngeal papillomata by conservative measures, such as the topical application of alcohol or formalin as compared to surgical intervention, should not the former be preferred to the latter?

Since our attention has been called to the use of alcohol in these cases, numerous observers have reported marked success.

At a meeting of this society in 1898, Dr. Halsted reported two cases of papilloma of the larynx which had recurred after operation and which were finally cured by the use of an alcohol spray.

In 1899, at a meeting of the N. Y. Academy of Medicine, Dr. Chappell reported a papilloma in a child cured by the topical application of alcohol. In this case tracheotomy had been performed and the question of cure must be divided between the two. Several of the speakers at this meeting reported excellent results with the use of alcohol. A case of my own is of interest as bearing on this point.

Rev. J. B. R. consulted me in the Fall, 1900, on account of a hoarseness which had been present at intervals for two years.

He had been compelled to give up his pastorate on the advice of another laryngologist on the possibility of an incipient tubercular laryngitis.

On examination, I found a pinkish excresence on the anterior portion of the left vocal cord, typical in appearance of a papilloma.

I advised its surgical removal. To this he would not give his consent and as an alternative I suggested the daily application of alcohol by his physician in the town where he lived, not having much faith in the final result. Six months later he informed me that his voice was perfectly clear and natural and that he had again returned to the pulpit.

Formalin has also been used with success in eradicating these neoplasms in the larynx.

The following case is of interest, reported by Dr. A. Bronner in the British Medical Journal, 1901.

Mr. P., age 45, seen first in June, 1896. Both vocal cords and parts of ventricular bands covered with typical papillomata. These were removed with forceps. In three months the growths were more abundant than before. They were again removed and lactic acid applied. In July they were as bad as ever. Finally a spray of formalin, beginning with 1 to 1000 and then 1 to 100 was used with the result of a complete cure.

The only other method of treatment which seems to me to commend itself in cases of children, is the method of prolonged tracheotomy.

In 1893, Dr. White of Richmond, reported a case of a boy 5 years old, in which papillomatous growths recurred quickly and luxuriantly after each operation. Tracheotomy finally became necessary. In 3 months the growths were greatly diminished and in three years had completely disappeared.

A number of other cases have been reported where the neoplasms disappeared entirely after prolonged tracheotomy, and while this operation is not devoid of danger, it must certainly be recognized as the safest of the extralaryngeal methods, especially when in the large majority of cases, recommended by Morell Mackenzie to be done in all cases, it is a preliminary operation to laryngotomy.

Such a procedure is certainly to be recommended when so excellent an authority as Sir Felix Semon has said that while brilliant results were sometimes obtained, recurrences usually took place after a thyrotomy and he knew a case where no less than 17 thyrotomies had been necessary on account of repeated recurrences.

In conclusion, I am free to admit, that according to my own clinical experience and a study of the literature of the subject, the best results in the management of these cases will be obtained as follows:

1. In adults and children suffering with laryngeal papillomata, the case should be kept under close observation

and prolonged treatment with topical remedies, such as alcohol and formalin, chlorid of zinc, etc., should be tried before resorting to surgical intervention.

2. In adults, should the mild treatment prove unsuccessful and especially should there be any interference with breathing, the endo-laryngeal removal with instruments may be resorted to.

3. In children the interval of mild expectant treatment should be even longer than in adults, and should the symptoms warrant surgical intervention, then prolonged tracheotomy is the safest and surest procedure.

4. Laryngotomy should be done only when all the other methods have failed.

Grand Opera House.

XLII.

EPITHELIOMA OF MIDDLE EAR.[*]

By W. H. Haskin, M. D.,

NEW YORK.

E. W., aet. 42, widow, with negative family history, complained of intense pains in left ear which radiated over the side of the head, forehead and occiput and down into the neck; also of very offensive otorrhea and of something protruding from the ear.

She had had running ear at intervals for the past thirty years, but never received treatment for there was rarely any pain. The original attack of O. M. S. C. came from scarlet fever. For two years past has had occasional attacks of weakness and vertigo, and believes she has lost considerable weight. The pain has been so severe for the past four months that she has been unable to sleep or rest well night or day. It was proceded by an attack of grip.

Hearing tests. Watch and acoumeter negative.

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Remarks made by Dr. Clemens in assigning case to me were: "That the left canal was filled by a large mucous polyp presenting in external meatus and completely filling the canal."

April 23, 1901. Removed with snare a large polypus, 3/4 of an inch long, apparently coming down from the attic. This was done under nitrous oxide anesthetization; profuse bleading ensued, and the canal was packed with idoform gauze.

May 8, 1901. Pain not relieved by operation and growth had completely filled the canal again; was very vascular, bleeding on slightest touch, so that malignancy was suspected. Pathologic examination of growth removed April 23, 1901, revealed only simple myxoma with cystic degeneration.

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[*] Read before American Rhinological, Laryngological and Otological Society, June 4, 1902.

May 31, 1901. The pain having continued as intense as before, she consented to a radical operation being performed and a complete enucleation of mastoid was done.

The incision was carried well up over the canal and the whole mastoid was exposed, the ear being separated and pulled forward on to the cheek. The outer plate was found to be very thick (1/4 of an inch) and of ivory denseness throughout. On removal of this plate a dark vascular mass was found occupying the antrum, attic and tympanum, all of which cavities had been much enlarged by pressure, the inner walls being carious. The bony posterior and superior walls of canal were almost destroyed by caries, there being but a small bridge of canal remaining.

The tegmen tympani, antri and attic were carious, and in removing these walls the dura mater was exposed both in middle and posterior fossae.

The bony wall of lateral sinus was also carious and was removed for at least an inch. The sinus was apparently not thrombosed and was not opened. As there was pus found in the tip, all the outer plate and cellular structure of the mastoid was removed. The disease extended above the canal well into the squamous portion, so that the bone removed was very extensive. The exposed bony surfaces were then swabbed with pure carbolic and absolute alcohol. After trimming off all the diseased portions of the soft tissues in the canal there was not enough left to form any flaps. The wound was then packed both posteriorly and by the canal.

June 2, 1901. Owing to the severe pain and headache for several hours, with a rising temperature, the first dressing was done. There was considerable staining of dressing, and the inner packing was very offensive. There were no granulations, but the whole wound was covered by a nasty grayish slough.

Hot bichlorid (1 to 5000) solution was ordered for irrigation and the wound was ordered to be dressed twice a day.

June 10, 1901. All odor disappeared, and the wound had granulated over but granulations were very pale and soft, and there was exposed bone in the antrum. The condition apparently continued to improve, though very slowly; the secretions were very profuse aad the granulations remained large, soft, pale and edematous, until the latter part of June, when she was discharged from the hospital and sent to the out door clinic.

The examination of the tumor removed on May 23, 1901, by Dr. E. L. Oatman, was pronounced to be an epithelial tumor, but not an epithelioma, although the whole course of the disease from time of operation indicated malignancy.

July 24, 1901. Patient was readmitted to the hospital with a swelling below the wound. The latter had not closed in at all with bone, but was filled with unhealthy granulations which simply poured out pus in all directions, very offensive in character. Ichthyol, enzymol, carbolic acid, nitrate of silver, and cupric sulphate were used to stimulate the granulations and two sinuses were scraped and packed.

August 9, 1901. Patient's condition had grown steadily worse, and a large swelling in the neck below the mastoid appeared. Ether was given and the whole wound was scraped out. A sinus was found leading downward through inner plate of mastoid and burrowing through sterno-cleido muscle and behind it. All the inner plates were removed exposing sigmoid sinus and jugular bulb. Another sinus leading backward toward occiput was thoroughly opened. and after careful irrigation the wound was packed with iodoform gauze. Examination of the granulations removed at this time were for the first time pronounced to be epithelioma without doubt. From this time on the conditions have steadily grown worse. She was discharged from the hospital about the middle of September and disappeared, having gone to Yonkers.

April 15, 1902. I saw her at Yonkers. The wound had increased in size; there was a large mass behind the ear reaching almost to the occiput and another involving the neck almost to the clavicle.

Dr. Foy. of Yonkers. who has taken care of her for six months, told me that he had cut away on three occasions large masses of growth which sprang out all around the wound, hiding the ear from behind, and which bled on slightest touch. On this day the granulations were very extensive, reaching well forward above the ear, though the auricle has remained uninvolved. The patient has suffered with most intense agony constantly, and has only been relieved by increasing doses of morphin.

Remembering the extensive exposure of both the cerebral fossae and of the sinus, one cannot understand why septicemia or meningitis has not intervened and relieved this poor woman of her wretchedness.

XLIII.

HYDROBROMIC ETHER; NOTES UPON ITS USE AS AN ANESTHETIC IN ADENOIDS AND TONSIL OPERATIONS.*

By D. J. Gibb Wishart, M. D.,

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Hydrobromic ether or ethyl bromid is a liquid prepared by distilling a mixture of alcohol, bromin and phosphorus. It is colorless, extremely volatile with a strong peculiar odor, and a warm sweetish taste. The specific gravity is 1.419. It boils at 106° F. On keeping, it is liable to liberate free bromin.

The use of this drug as an anesthetic is not new in America, but so far as I am aware, it is new in Ontario, and, therefore, the following notes, prepared as a result of the administration of the drug to a series of patients (21) in the Hospital for Sick Children, since January last, may not be without interest. The drug used was that prepared by Merck, put up in one ounce glass stoppered bottles, and while the greatest care was exercised to prevent evaporation, it was seldom possible to obtain more than four anesthesias per ounce. Application was made with a closed inhaler, consisting of a metallic framework, the shape of a cylinder, with cross-sectioned fenestræ in the frame, through which a cotton bandage is woven backward and forward to expose as much inhaling surface as possible, one end being left open and the other encased in a rubber covering. Into this a fluid drachm of the ether was placed, and the mask was quickly glued over the mouth and nose of the patient, every particle of air being rigidly excluded as far as possible, until complete anesthesia was produced. The administrator watched the cornea of the patient, while another attendant kept track of the pulse with a watch, announcing aloud each quarter of a minute. The patient was seated in the upright position in an ordinary chair, the legs and arms being controlled by a nurse, or by a bandage. The mouth gag was inserted and opened, and every preparation was made for rapid operation before anesthesia was commenced. During the pre-anesthetic stage in the majority of instances there was struggling, as a rule easily controlled, and lasting only several seconds. On an average anethesia was complete in 62 seconds, or exclusive of three special cases 49 seconds, and lasted about 53 seconds. In one or two instances the anesthesia seemed very incomplete. and yet the patient would not acknowledge having been aware of anything taking place, or of the sensation of pain. In the majority of cases, the anesthesia was quite satisfactory. The normal color of the patient was maintained in every instance, and no blueness nor embarrassment of the respiration was perceived in any case. Several of the patients were allowed to walk out of the operating room, which they did without difficulty or assistance. The majority of the patients, however, were made to lie upon the stretcher, face downward, a position I always chose in these operations to prevent the swallowing of blood. The pulse was slowed in the majority of instances, and in a number became stronger, these results being the opposite to those found by H. C. Wood. The only after results were a headache in two cases and drowsiness in five others. Vomiting and nausea were entirely absent.

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*Read before the Ontario Medical Association, June 5th, 1902.

The period of anesthesia with ethyl bromid is so short in duration, at most about fifty seconds, that the operator requires to be ready and speedy, and the operation must proceed without a hitch. When adenoids only are to be removed, this can be done with the curette or forceps, and afterward the finger used to examine the vault, and all fragments taken away, easily within the time limit. If, however, the growths exist chiefly in the neighborhood of the Eustachian tubes, it may prove difficult to remove them thoroughly within the time allowed. Again, when the enlarged tonsils are free of the pillars, or if attached are only single, but slight difficulty will be experienced.

When all the tonsillar ring is enlarged, or when any peculiar features are presented, such as a submerged tonsil, the term of anesthesia is too short, and removal if attempted will prove unsatisfactory. It is better in such instances to divide the operation between two or more sittings, or to use one or the other forms of anesthesia.

The sitting posture of the patient allows of the head being held forward by the administrator, during the operation, so that all blood drips out of the mouth and nose, and the tendency to inspiration of blood and laryngeal embarrassment, so annoying in anesthesias which require the prone position, is obviated and avoided.

Some years ago the writer used nitrous oxid alone, or combined with oxygen in these operations, but abandoned them shortly, chiefly on account of the cumbersome nature of the apparatus required. The use of nitrous-oxid alone is objectionable to the writer for two reasons: first, the position of the patient which must be as near prone as possible; and secondly, the terrifying nature of the color, and the embarrassment of respiration produced. The difficulty with regard to the color is obviated by the combination with oxygen, but the apparatus is rendered more cumbersome. Ethyl bromid is superior to these, therefore, because the normal color is retained, respiration is not interfered with, and the apparatus can be carried in one's pocket.

The struggling so frequent in this series may be due to the fact that the patients were all children, the average age being 7 2/3 years. In no case was it so extreme as to interfere with the operation.

It is hardly fair to put these cases on record without making reference to the experience of other operators, and especially to that of the writers upon anesthesia. C. P. Hewitt, in his last edition,[1] devotes considerable attention to bromid of ethyl, chiefly depending for his statements upon the observations of Dr. J. F. Silk, in 130 cases where this anesthetic was used in dental practice. The effect produced is described as analgesic rather than anesthetic, and when inhalation exceeded two minutes, the after effects were liable to be troublesome. The average time required to produce anesthesia was sixty-six seconds, and the average duration forty-six. The administration of the anesthetic was continued until snoring, breathing, or insensibility of the cornea was produced. Several deaths that had occurred during, or immediately after administration, were investigated by Dr. Silk, who says that in some of these[1] sudden and early heart failure occurred; in others[2] respiratory paralysis took place somewhat later in the administration; and in others again[3] gastro-intestinal symptoms were recorded. Hewitt does not look upon bromid of ethyl with favor, regarding it as less safe than nitrous oxid, but advises further experiment where brief anesthesia is required.

H. C. Wood, of Philadelphia,[2] regards bromid of ethyl as a cardiac depressant, the action upon the heart being similar to that of chloroform, and states that the pulse usually becomes increased in rate, and somewhat diminished in force.

Gleitsmann of New York[3] who has used the drug since 1894, prefers it for short operations, and only records one case of suspended respiration.

In the clinic of Lermoyez in Paris, as reported by Sondern,[4] the amount used for a child is 5 to 10 grams. Anesthesia is arrested when the pupils dilate, and the conjunctiva begins to slowly suffuse, after which, if the anesthetic be continued, the muscles are found to contract. Anesthesia lasted about two minutes.

Malherbe[5] operates with the head hanging over the table, and gives the patient a few whiffs before putting on the full amount of the anesthetic. He has used the drug in 3,024 operations, and has obtained a fifteen to twenty-five minutes anesthesia. Here, of course, the administrations have not been confined to the narrow field contemplated in this article.

Kempter[6] uses a crash towel in a cone shape, and a dose of from 1 to 2 and a half drams. He states the mortality rate, reported at the Surgical Congress in Berlin, from 1890 to 1897 was 1 in 5,238 cases.

I am indebted to Dr. W. Lowry of the Hospital for Sick Children for the following detailed report of the cases and for much assistance in making the experiment.

Init.	Aet.	Sex.	Disease.	Amt.	Time, Seconds.	Pre-Anesthetic Stage. Phenom.	Time, Seconds.	Anesthetic Stage. Phenom.	Post-Anesthetic. Stage After Result.
W. L.	4	M.	Tonsils.	d.¾	60	Struggling pulse rapid and strong.	20	Struggling weaker and rapid pulse. Anesthesia very short, not sufficient used.	
E. T.	4	F.	Adenoids.	d.i	60	Pulse strong strong and rapid.	60	Pulse full and strong. Anesthesia good.	
G. M.	4	M.	Tonsils Adenoids.	d. i	60	Rapid and full pulse for 20 sec., then became weaker.	60	Not profound, pt. struggled at end of 30 sec., op took 40 sec., pulse quite weak.	Pt. quite bright immediately afterward
F. L.	8	F.	Tonsils Adenoids.	d. i	60	Pulse rapid and strong, some struggling.	60	Pt. very weak during anesthesia, struggled at the end of 55 sec., conscious at the end of 2 min. from start.	No ill effects.
W. H.	6	M.	Adenoids.	d. i	60	Struggling, face flushed, veins of neck prominent, pulse rapid and strong.	45	Pulse slower and weaker, difficult to feel.	No excitement.
R. G.	10	F.	Tonsils Adenoids.	d. i	45	Struggling, flushing of face, pulse full, rapid and strong.	60	Pulse slower, weak but full.	No excitement, pulse good pt. could have walked in 5 min. No after res.
M. K.	9	F.	Adenoids Tonsils.	d. i	45	Struggling, flushing of face, pulse full, rapid.	30	Pulse slower, but strong.	No excitement. No after result.
M. C.	9	F.	Tonsils Adenoids.	d. i	45	Rapid and full. then rapid and weaker, some struggling at first.	12	Slow and weak. color good. anesthesia fair.	Quite a lot of excitement.
N. B.	13	F.	Tonsils Adenoids.	d. i	60	Rapid and strong pulse. some struggling at first.	60	Slow and weak pulse, anesthesia good.	No excitement, pt. was dazed and drowsy for some time

A. G.	4	M.	Tonsils Adenoids.	d. ss then d. i	3 min.	A lot of struggling, rapid full pulse, no anesthesia until extra d. i was given.	60	Slow and weak pulse, good anesthesia.	Dazed and drowsy for some time.
E. N.	11	M.	Adenoids.	d. i	50	Rapid and full pulse, no struggling.	70	Slow and strong pulse, good anesthesia.	
G.	7	F.	Adenoids.	d. i	50	Struggling at first, pulse rapid and full.	40	Slower and hard to feel on account of struggling.	Pt. excited, restless and dazed.
T.	4	F.	Adenoids.	d. i	45	Struggling at first, face flushed then pt. became very quiet.	40	Pt. very quiet and lax, more so than any case yet, very satisfactory anesthesia.	Pt restless and tossed about for a time.
B.	11	M.	Adenoids.	d. i	50	Pulse full and rapid. Pt. struggled quite a lot. face flushed and eyeballs prominent.	30	Pulse quite slow, regular and full.	Pt. quite conscious, in a couple of minutes walked into another room, In 2 min. was restless, tossed about twitched his hand and muscles for some time.
N. B.	13	F.	Tonsils.	d. i	30	Pulse rapid and strong, quite a lot of struggling.	60	Pulse slower and weak, fair anesthesia.	
T. W.	3	M.	Adenoids.	d. i	30	Rapid and full, no struggling.	30	Rapid and strong. anesthesia very short. Struggled toward the end.	
C. E.	10	M.	Tonsils Adenoids.	d. i	35	Rapid and full, quite a lot of struggling.	50	Pulse full and strong, slow. Anesthesia short but good for tonsils.	
"	"	"		d ss	30	Rapid and strong, extra d. ss given for adenoids.	45	Good anesthesia, pulse rather weaker.	Depressed and dazed for a short time.

T. B.	10	M.	Ankylosis elbow.	d. i	120	Pulse rapid and strong. quite a lot of struggling.	60	Pulse quite strong, but slower. Anesthesia quite satisfactory, Muscles quite relaxed and no pain felt.	Some drowsiness afterward.
T. B. (2nd time next day.)	10	M.	Ankylosis elbow.	d. i	135	Struggling and noisy excitement, pulse full and strong, rapid.	60	Slow and weaker, very satisfactory, struggled a little but did not feel pain.	

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XLIV.

THE PROTECTION AND PRESERVATION OF THE LABYRINTHINE WALL WITH REFERENCE TO THE PROGNOSIS FOR HEARING IN RADICAL TYMPANO-MASTOID EXENTERATION.

By Redmond Payne, M. D.,

SAN FRANCISCO.

In all the descriptions of the Stacke and Schwartze-Stacke operations, directions are given that when the diseased cavities are reached they are to be thoroughly exenterated and their walls thoroughly curetted, the idea conveyed being that it is an ordinary abscessed cavity, which is cut down upon with the idea of cleaning it out, throwing all these cavities into one which is subsequently lined with skin flaps. There seems to be little thought in these directions for the future function of hearing and the labyrinthine wall with the stapes or its foot plate is considered simply as a part of the general abscessed cavity, and the inference left that it is to be handled in the same way, namely, by general and thorough curettement.

Now, if we but recall the anatomic conformation of the tympanic cavity proper with its most important structure, the stapes and labyrinthine wall, in relation to the adjoining cavities, the attic and mastoid antrum, we see that it is entirely unnecessary to touch the tympanic cavity proper with the curette, because the cavities to be exenterated, namely, the antrum and the attic, are very much above its level, and are the only portions from which free drainage is not secured from the external meatus.

The object of these operations is to thoroughly remove their contents and obliterate the diseased cavities which have been a menace to life. This can all be done and all the cavities thrown into one without encroaching radically upon the labyrinthine wall in the lower two-thirds of the tympanum proper. Though this portion of the middle ear be diseased to the extent of the formation of polypi and granulations, it is readily reached through the external meatus, so that this diseased tissue can readily be removed and free drainage secured by milder means, and in a manner that is less likely to damage the hearing so seriously.

In most cases of otitis media when the disease is confined to the middle ear proper, we have but little trouble in curing the disease. It is only when the process extends to the attic or to the mastoid antrum, that is, to points which we cannot reach readily through the external meatus, that the disease is so frequently incurable without the radical operative measures, namely, the Stacke and Stacke–Schwartze operation.

Viewing the subject from this standpoint my last Schwartze-Stacke operations have been made so that the antrum and the attic were thoroughly exenterated and curetted, but the labyrinthine wall in the lower two-thirds of the tympanum proper has not been encroached upon; that portion being left to be treated subsequently through the external meatus. The results have been very gratifying as regards the amount of hearing saved or regained. One is thus enabled to use small wire curettes and carefully clear away diseased tissue from the labrinthine wall, from around and about the stapes and its foot plate, without dislocating it and by means sufficiently mild to preserve its integrity and function.

During the successive steps of the radical operation, we come to a point where the malleus is carefully lifted out together with the tympanic membrane, and subsequently the incus. These are the two principal structures occupying the attic and exposes at once the tympanum proper which is lined with mucous membrane and may or may not be extensively diseased. At any rate the tympanum proper is thus thoroughly exposed and drainage from it unobstructed, and so thoroughly exposed are its walls and easily reached through the external meatus that there is no reason for applying the heavier mastoid curettes to it, which must necessarily endanger the stapes or its foot plate or the labyrinthine wall, and thus remove every possibility of preserving or regaining the function of hearing.

By leaving the tympanum proper to be dealt with subsequently, the other steps of the radical operation, namely, the thorough exenteration of the attic and the mastoid antrum can be proceeded with as usual. When the operation is finished and the skin flaps formed by the cartilaginous meatus held in place by gauze packed in the external auditory meatus, the very pressure of this packing exerted upon the granular mucous membrane of the tympanum does much to promote its absorption and bring about a healthy condition of it. When the skin lining of the newly formed enlarged cavity has so far advanced that we have more or less of a dry cavity to deal with, the labyrinthine wall and stapes can be dealt with much as we would treat a chronic suppurative otitis media with the disease confined to the tympanum proper, that is cleansing with alcohol, the careful use of the small wire curette for the removal of granulations or the careful application of chromic acid to these points, or the dusting over the surface with aristol and boracic acid powder as best seems indicated in the case, and very gratifying results obtained. In fact, since modifying the radical operation as detailed above, the result in hearing has been quite equal to that secured by the treatment of the ordinary chronic suppurative otitis media without attic or antrum involvment.

The object of this precaution in the technique of the radical operation is, as I have said, to preserve and protect the labyrinthine wall and to leave the stapes intact. To the extent that this is successful the mucous membrane lining of the tympanic cavity is preserved intact, and not infrequently when both the external and internal wound have completely healed and the case is ready to be dismissed, a little mucous discharge will collect in the meatus from time to time, necessitating occasional cleansing of the external meatus by the patient with a little borric acid solution. If the discharge is sufficient to give the patient much annoyance, a few drops of 10 per cent. protargol solution dropped into the ear after the cleansing, diminishes it and makes it quite tolerable cosmetically. In some of my cases there has been a small quantity of this mucous discharge. I have not sought to arrest it entirely, for by doing so the hearing has nearly always been reduced. It seems to serve the purpose of keeping the mucous membrane about the stapes flexible and serving to a certain extent as an artificial drum, and only requires of the patient a little additional detail in the matter of a toilet, to give him serviceable hearing. This mucous accumulation can do no possible harm; the attic and mastoid antrum having been obliterated in one large cavity lined with skin with ample room for exit through the external meatus, it is not probable that any trouble in the way of retention can take place.

I have no doubt that many of my colleagues have already modified their radical operations along these lines, but never having seen any reference to such modification in any one of the descriptions of the Schwartze-Stacke operations either in the text books or in literature on the subject, has prompted me to simply call your attention to it.

XLV.

REPORT OF A CASE OF RAPID NECROSIS OF THE TEMPORAL BONE FOLLOWING SCARLET FEVER.*

By Francis R. Packard, M. D.,

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The case which I desire to record presented several points which seemed to me of sufficient interest to warrant reporting to this society, namely the rapidity with which necrosis of the temporal bone occurred in connection with suppurative otitis media, the extent to which the necrosis developed on one side as compared with its absence on the other, and the negative character of the bacteriologic findings.

S. E., a boy, Russian, 4 1/2 years of age, presented himself at the dispensary of the Philadelphia Polyclinic suffering from a suppurative otitis media affecting both ears. The history given by the child's father was that he had somewhat over two months previously been attacked with diphtheria and removed from his home to the municipal hospital; while in that hospital he had contracted scarlet fever. He had been discharged from the hospital a few weeks prior to his coming to the Polyclinic. Previous to these illnesses he had been absolutely healthy and no trouble of any kind had ever been noticed in his ears.

Examination showed the child to be fairly well nourished and healthy looking; there was some enlargement of the cervical glands on both sides of the neck; both ears were discharging profusely, the discharge being of a muco-purulent character, very thick, yellowish and offensive. After cleansing it was found that the right membrana tympani was practically entirely destroyed; there was a mass of granulated tissue on the site of the ossicles; no dead bone could be detected. After cleaning the left ear the external auditory canal was found to be almost completely blocked by a large sequestrum of bone. This sequestrum when touched with a probe was movable, and pressure would sqeeze from under it bubbles of fluid and air. Several polypi immediately surrounded the sequestrum; they were small and did not interfere greatly with the view of the part. There was no tenderness over the mastoid nor any other indication of trouble in that region.

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*Read at the meeting of the American Laryngological, Rhinological and Otological Society, Washington, D. D., June 2, 1902.

The father was told that it would be necessary to operate for the relief of the child's condition, but declined to give his consent to the operation for some days. During this interval the child's ears were cleansed and the polypi and granulation tissue removed as far as possible. The father finally allowed us to operate on the boy on the 13th of January, 1902.

The child was etherized at the Polyclinic Hospital, and, assisted by Dr. Walter Roberts, I performed a complete tympano-mastoid exenteration on the left side. The sequestrum which had been seen and felt in the external auditory canal was found to consist of the anterior portion of the outer wall of the mastoid and the posterior wall of the external auditory canal. On dividing the periosteum over the mastoid process, while pressing rather hard upon the knife, the whole cortex was found to be loose and came away as one piece about the size of a quarter of a dollar. Besides this there were two or three other pieces of necrosed bone the size of a dime, with large cholesteatomatous masses.

The subsequent course of the case was uneventful except for the occurrence of a facial palsy which developed about ten days after the operation: this has disappeared. The child's ear continues to discharge somewhat, although his general condition has been greatly improved.

Repeated bacteriologic examinations resulted in the finding of numerous streptococci and staphylococci but no Klebs-Loeffer bacilli in the discharge from both ears. Although the discharge continues in the ear which was not operated upon, there is no evidence of dead bone. I consider it interesting that the bacteriologic findings should be identical in both ears when the gravity of the affection varied so greatly in them.

XLVI.

THE RHINOLOGIST AN IMPORTANT FACTOR IN THE PREVENTION OF TUBERCULOSIS.*

By F. M. Pottenger, Ph. M., M. D.,

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The rhinologist, while at first looked upon with disfavor by the general practitioner, has made a worthy and enviable place for himself in the field of medicine. He has called the attention of the laity and the profession to the importance of normal physiologic respiration, and to the pathologic conditions produced where it is interfered with.

The importance of his work in the field of otology is shown by the fact that 70 per cent. of ear cases are due to causes situated in the nose and naso-pharynx. An eminent aurist has said that if the rhinologists would do their duty and attend to the nose and naso-pharynx of the children of this generation, there would be little use for aurists in the next generation.

His mission is of more importance and just as positive in the treatment of tuberculosis as it is in the prevention of deafness.

The nose, alone, was intended to conduct the air to the lungs, and for this purpose it was admirably fitted. The lungs should, if possible, receive none but pure air, and air of a tolerably constant degree of temperature and moisture; but wherever man dwells, he is subjected to dust and variation in the thermometric measurements. The nose, placed at the beginning of the respiratory tract, has as its important function, the preparation of the air for its entrance into the lungs.

The vibrissae stand at the vestibule and act as a strainer

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separating the particles of dust and bacteria from the air in its passage. Those which succeed in passing these sentinels, meet the moisture of the nasal cavity, are precipitated, and removed, partly by sneezing, partly by blowing the nose, and partly by the cilia waving them toward the throat, whence they are expectorated.

Next in importance is the change in temperature which takes place in the air. The mucous membrane of the nose is abundantly supplied with blood vessels, which, under the control of the vaso-dilators and constrictors, send more or less blood to the part as necessity demands. Thus the air from the frozen north or the hot tropical desert can be tempered by the same mucous membrane in the short space of time necessary to pass from the tip of the nose to the pharynx.

This same mucous membrane moistens the air and renders it free from irritation.

Where nasal respiration is interfered with certain changes take place in the economy which are well known. Those suffering from nasal stenosis have a dull heavy look; the outlines of the face are changed; and in many instances the bony framework of the chest is deformed; but, what is of most importance to the individual, is the general lowering of vitality and chronic catarrhal condition which such breathing induces.

Remembering that the currents of air in the nose take an upward course and pass backward along the superior meatus, striking the oro-pharynx at its uppermost portion, we see that a hypertrophied middle turbinal is of far more importance pathologically than a similar condition of the inferior turbinal, and that spurs and septal deviations which run up toward the roof of the nose are the ones to correct for nasal stenosis. We can also understand how a little mass of adenoid tissue filling the upper portion of the naso-pharynx will cause serious mouth-breathing.

Aside from the induction of mouth-breathing, the enlargement of the lymphoid tissue forming the tonsillar ring, affords a pathologic condition which offers an easy entrance to the germs of disease. It has been shown that the specific germ of several diseases gains entrance to the body through the tonsils, notably acute rheumatism, scarlet fever, chorea and tuberculosis.

Tubercle bacilli are often found in the tonsils when there is no tuberculosis present in other parts of the body. Dieulafoy inoculated sixty guineapigs with tonsillar tissue; eight, thirteen per cent. of them, succumbed to tuberculosis. He also inoculated thirty-five guineapigs with adenoid tissue; of these seven, twenty per cent., succumbed to tubercolosis. In none of these was tuberculosis present in the subject from which the tissue was taken. While these experiments have been disputed by some observers, they have been confirmed by the carefully conducted experiments of Lermoyez, Brindle and Gottstein.

Though tubercle bacilli are not always found in tonsillar and adenoid tissue in sufficient numbers to infect guineapigs, nevertheless they are found in these tissues in individuals who are apparently free from tuberculosis, which fact leads to the inference that the tonsils and adenoids may be ports of entry for the tubercle bacillus, whence it passes on into the lymph stream.

The long accepted theory, which accounted for infection of the lungs by direct inhalation of bacilli, has much to account for. If respiration be normal, germs, to so enter, must withstand the action of the vibrissae, the nasal mucus, the attempts to throw them out by sneezing and blowing the nose as well as the ever active cilia of the epithelium If mouth-breathing be present, they encounter the moisture of the oral cavity, which precipitates them upon the mucous membrane, there to gain entrance to the tissues or to be cast off with the expectoration. Whether respiration be normal or whether mouth-breathing be present the residual air in the lung will be a force sufficient to render the possibility of direct infection of the finer air passages and air cells almost nil.

In place of the direct inhalation theory then we are forced to the conclusion that the common channel of infection is through the lymphatics. Baumgarten has thrown much light on this subject by recent experiments in which he succeeded in producing apical tuberculosis by injecting small quantities of tubercle bacilli into the urethra, bladder, under the skin and into the eye. From all of these points of inoculation the bacilli were carried, through the lymphatics, into the apex of the lung, where they formed tubercular nodules. With such evidence before us, the role of the rhinologist assumes increased importance. Tubercle bacilli are breathed in daily, but under normal conditions the organism is able to throw them off; but, when nasal respiration is interfered with, there is great danger, for then the organism has lost the protection which nature has provided against such invaders. and the only chance of ejecting the bacilli is through expectoration. The catarrhal condition which naturally exists where nasal respiration is interfered with, offers greater opportunity for germs to gain entrance. Osler says: "A special predisposing factor in lymphatic tuberculosis is the catarrhal inflammation of the mucous membrane, which, in itself, excites slight adenitis of the neighboring glands." It is not necessary to have a catarrhal condition of the mucous membrane present, for the bacilli are able to enter either by inter- or intra-cellular channels through the healthy mucous membrane, as has been shown by Orth, Klebs, Baumgarten and others; nevertheless, such a condition, when present, greatly facilitates their passage. Wright says: "We must assume at present that the tubercle bacillus passes into the lymphatics through the mucous membrane of the naso- and oro-pharynx in a very large proportion of cases of pulmonary infection."

The rhinologist must assume the responsibility of protecting the organism against the tubercle bacillus. While catarrh does not run into consumption, nevertheless mucous membranes affected by it possess a lowered resistance and are the seat of small abrasions, which offer an easy entrance to the tubercle bacillus.

It is not only the part of the rhinologist to prevent infection by keeping the mucous membranes in a healthy condition, but he also has the opportunity to diagnose the disease in its incipiency; for it is to him that those in the early stages of tuberculosis are apt to come for relief from a slight though persistent cough, especially after talking or laughing or a protracted cold, which refuses to yield to ordinary measures. Coughs and colds, not yielding to treatment in a reasonable time, should be branded as suspicious. A two-hourly temperature chart of such cases often gives valuable information. In all such cases a careful examination of the chest should be made and the clinical history should be carefully elicited.

It is of much importance to the individual to know at the earliest date possible if tuberculosis be present, so no measures should be omitted which will throw light on the diagnosis. With a thoroughly trained ear, the tuberculin test, the Roentgen rays and the microscope, we are able to detect tuberculosis in the incipient stage in nearly every instance that comes to our notice, before the stage of consolidation. With the first two, most cases can be detected before bacilli appear in the sputum.

The chances of cure in tuberculosis decreases as time passes. In the early stage from sixty to ninety-five per cent. of the cases are being cured. Turban of Davos says that ninety-seven per cent. of those in the early stage should be cured. How hopeful this disease, then, if only an early diagnosis be made!

As rhinologist then we must assume a two-fold duty in the fight against tuberculosis. We must keep the upper air passages healthy and thus diminish the chances of infection and we must be able to diagnose the disease in those incipient cases which seek relief at our hands.

Bradbury Block.

XLVII.

SPASMODIC TORTICOLLIS FOLLOWING AN ADENOTOMY.

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Spasmodic torticollis is an affection characterized by tonic or clonic spasms of certain muscles of the neck, by which the head and cervical spine are rotated or drawn backward.

From an etologic standpoint this affection is entirely distinct from congenital wry neck, but the resulting condition is similar. One sterno-mastoid muscle is contracted spasmodically and stands out prominently. The other rotatory muscles of the head may be involved. The chin is turned toward the opposite side and upward. The head is inclined toward the affected side. The spasm may be tonic or clonic, and ceases during sleep. Spasmodic torticollis occurring as a consequence of operation of any kind is very rare. In an exhaustive search through the literature, foreign as well as our own, I have been able to find the report of only one case following, and apparently due, to an adenotomy.

This case was reported by Dr. J. F. McKernon.[1] The patient was a girl, nine years old, and was first operated upon for enlarged tonsils without an anesthetic. Two days later, an adenotomy was done, under ether. There was a large amount of adenoid tissue. It was unusually firm but was thoroughly removed with a Gottstein currette. Twenty-four hours after the operation, the Doctor noticed that the patient's face was turned toward the right shoulder. The head could be manipulated and turned back to the median line, without pain, but when it was released it slowly turned back toward the right. Examination of the naso-pharynx showed a small mass of adenoid tissue remaining on the right side.

Doctor Terriberry, the consulting neurologist, saw the case and expressed the opinion that the condition was a purely reflex one. The case was treated according to this hypothesis. Sedatives were given internally and counter-irritation was applied over the back of the neck. The remaining mass in the naso-pharynx was not removed. One week after the operation, the position of the head was improved and by the ninth day the head was in the normal position.

This case was seen by Doctors Morris J. Asch and Charles Knight. Doctor Knight reported the case to the Neurological Section of the New York Acadamy of Medicine, February 16th, 1894. He says there are three ways in which the symptoms might have been produced: (a) by an actual wound of the rectus muscle, (b) by contusion of the muscle from extraordinary pressure in curetting, (c) by a lesion of the nerve filaments in the mucous membrane resulting in a reflex irritation of the muscles engaged in rotating the head. The first and second theory could be excluded and the third seemed to explain the symptoms.

My own case occurred in a well nourished boy, seven years old, who was brought to my clinic in the Lakeside Hospital. His family and personal history were good. He had a typical adenoid expression, but otherwise appeared to be normal. The nasal fossae contained a small amount of muco-purulent secretion and the inferior turbinals were slightly hypertrophied. The pharynx was granular and and the naso-pharynx was filled by a mass of adenoid tissue. Cocain was applied and the adenoid tissue removed with a Gottstein curette. The amount of hemorrhage was slight, and the boy said that the operation had not hurt him much. About an hour after the operation he was sent home with his mother.

Two days later he returned with a typical torticollis. The right sterno-mastoid muscle was tensely contracted. The other rotatory muscles of the head did not seem to be involved. The head was drawn toward the right side, and the chin pointed upward and toward the left. His mother said that about three hours after the operation he complained of pain in his throat and his face was turned toward the left. This condition had continued during the day but disappeared at night, when the boy was asleep.

An examination of the nose and naso-pharynx showed that the operation had been complete. The adenoid tissue had been well removed and the site of the operation was healing nicely. There was no apparent injury to any of the surrounding structures. The boy had behaved so perfectly at the operation, that I could exclude the possibility of having used undue force in operating.

The only explanation of the torticollis seemed to be to consider it a reflex neurosis, and I decided to treat it by suggestion. I began to massage the right sterno-mastoid muscle and with firm pressure turned the head back to the normal position, assuring the boy that the manipulation would cause him no pain and that his head and neck would be freely movable, or remain in the proper position. While he remained in the clinic, the torticollis did not recur, but when he came back two days later, his mother said that the spasm had returned soon after they had left the clinic, but that it was less marked than at first. He was treated in the same manner as on the previous visit and the torticollis was easily overcome, and did not recur. When I saw the patient the last time, ten days after the operation, he appeared perfectly well. The naso-pharynx was in good condition and there had been no return of the torticollis.

The treatment by suggestion and massage, may have hastened the recovery a little, but I think that the boy would have recovered without any treatment.

Cases of spasmodic torticollis, originating reflexly, have been reported. Noble Smith in his exhaustive treatise on spasmodic torticollis,[2] makes no mention of this affection occurring as a consequence of operation of any kind, but refers to a case[3] of a child three years old, in whom a severe blow upon the clavicle was followed by spasmodic torticollis. He also mentions a case,[4] reported in 1813, in which spasmodic movements of the tongue, face and neck, after resisting other treatment, were cured by the removal of some badly diseased teeth.

Hancock, in 1859, reported a case,[5] of non-spasmodic torticollis of six months standing, which was relieved by the extraction of a decayed tooth from the lower jaw.

Cases caused by disease of the eye have been reported by several observers.[6] Other cases have also been attributed to diseases of the ear.[7]

A. J. Gillette has reported two cases of torticollis. which were benefitted or cured by adenotomy[8]. One of these was a case of congenital torticollis in a child sixteen months old. The tonsils were hypertrophied and the vault of the pharynx filled with adenoid tissue. An adenotomy and double tonsillotomy were done and the torticollis disappeared and had not returned three months after the poeration.[9] The second case was a child three years old, in which the torticollis had been present for six weeks, and was cured by adenotomy.

It seems reasonable, therefore, to suppose that in my case the irritation caused by the operation in the naso-pharynx produced reflexly through the gloso-pharyngeal and spinal accessory nerves, the spasm of the sterno-mastoid muscle, and so caused the torticollis.

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XLVIII.

A CASE OF EPITHELIOMA OF THE AURICLE AND AUDITORY CANAL.*

By Thomas R. Pooley, M. D.,

NEW YORK.

Cases of epithelioma of the external ear are of such comparatively rare occurrence as to warrant the report of any case, especially when the results of the treatment can be shown by the presentation of the patient. This alone is my excuse for presenting this patient to the society with a brief account of the case.

The patient, aged fifty-eight, came to my clinic in the New Amsterdam Eye and Ear Hospital on September 17, 1900, with the statement that he had first noticed a nodule on the auricle some five years before, which came in time to be an ulcer. From the commencement, although it had been treated with various salves, caustics and pastes, and once by operation, it gradually increased in extent until he sought my advice.

Status Præsens.—Situated in the upper part of the helix, just about the region of the anthelix, was a growth, nodular in character, extending downward, from the lower part of which growth there was a whitish reticular tissue, somewhat similar to cicatricial tissue, involving respectively the concha, tragus, antitragus, and extending into the auditory meatus. The dimensions of the growth were half an inch in length by three-quarters of an inch in width.

The patient being etherized, a transverse incision was made along the upper margin of the growth, then two vertical ones on either side, and all the suspicious tissues carefully dissected out. At one place in the meatus, where the growth seemed to invade the deeper structures of the auditory canal, it was scraped out with a sharp spoon, as was also some of the cartilage of the concha. In this dissection a considerable amount of the cutis of the helix, the tragus, and the antitragus was excised.

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*Read before the Eastern Section of the American Laryngological, Rhinological and Otological Society, March 1. 1902.—From the New York Medical Journal.

The upper part of the auricle was then drawn forward by a continuous suture, and the lower part by two interrupted sutures, thus decreasing considerably the size of the wound resulting from the gaping of the incisions.

The healing was soon accomplished, but there was considerable swelling, redness, and the formation of blisters over the area of operation and extending over the adjacent surfaces, which resembled very closely erysipelas, but as there was no rise of temperature, I concluded it to be due to poisoning from iodoform gauze. This being replaced by simple, sterile gauze, healing rapidly took place, and the patient left the hospital in one week.

On October 24th the wound had entirely cicatrized, and I saw nothing more of the patient until January 2, 1902, when he returned with a recurrence of the disease, which is described in the hospital record as follows: "A nodule about the size of a pea, 1/2″ in front of the tragus, and a deep erosion at the posterior and outer part of the auditory canal, about 1/2″ square and extending for some distance into the canal. Another deep ulcer 1/4″ wide at the junction of the lobule with the cheek. An operation was done the same day with the patient under ether, which consisted first in circumscribing with a scalpel all of the diseased tissue in the auditory meatus, then by means of it and strong scissors removing it, after which by means of a sharp spoon all suspicious tissue was carefully scraped away until in some parts of the anterior wall of the canal the periosteum was removed down to the bone. The small growth in front of the tragus was then excised, as was also the deep ulcer in the cleft of the lobule. Finally, the wounds left by the excision of the growth in front of the tragus and the lobule were drawn together by sutures, the meatus packed with sterilized cotton, the wound covered with iodoform gauze, and cotton, and a firm roller bandage applied."

On the day following the dressing was removed and no unfavorable symptoms were noticed. That night, however, the temperature rose to 100°, and the pulse to 100, and the next morning the right side of the face was swollen almost beyond recognition. The swelling included the whole auricle and involved a number of glands in the neck. There was intense redness, with numerous small blebs. All this was limited exactly to the median line. A diagnosis of facial erysipelas was made, a solution of acetate of lead and opium applied, and half a teaspoonful of tincture of chlorid of iron given three times a day. Under this treatment the condition rapidly subsided; the temperature rose only to 101°, and the pulse to 110, and by January 7th the swelling and the redness were gone and the temperature and pulse were normal. During this entire phase of his condition the favorable granulating of the wound was never interfered with, and the patient was discharged January 9th, just one week after the operation.

Considering the rapid healing and the inconsiderable constitutional symptoms, I am led to believe that the reaction here, as after the first operation, was an acute dermatitis due to iodoform poisoning and not to facial erysipelas, especially as it occurred after both operations, and soon got well after the iodoform gauze was left off. The further healing of the wound has been slow, by granulation, and there is now complete cicatrization except for one minute ulcer on the upper wall of the meatus. Whether this is a place which has not entirely closed, or is a return of the growth, I leave undetermined.

According to Politzer, the starting point of epithelial new formation is most frequently the auricle and the external meatus, less frequently the tympanic cavity and mastoid process.

On the auricle the epithelioma is usually developed in the cutis on the upper part of the helix, and spreads from there at first gradually and then very quickly over the greater part of the auricle, the cartilage of which is ulcerated in various parts and perforated.

If an epithelioma of the auricle is not excised in time, it spreads, involving the side of the head and neck and (as it did in my case) the auditory canal, then the middle ear and the rest of the bones of the head and cranial cavity. The destruction may reach such an extent that not only is the middle ear exposed, but also deeper parts of the skull, and a fatal termination ensues. Thus, in a case reported by Delstanche fils (*Archiv für Ohrenheilkunde*, xv) the growth proceeded from the inner surface of the right tragus and extended so far that the tympanic cavity and Eustachian tube, the posterior part of the frontal bone, the lining of the sphenoid bone and the posterior wall of the orbit were destroyed and exposed. Symptoms accompanying this destruction were facial paralysis, amaurosis, loss of taste and smell, and paralysis of the right palatine muscles. Death resulted from the extension of the cancer to the dura mater. In my judgment the proper and only treatment for epithelioma of the auricle, whenever this is possible, is excision of all the growth well into the healthy tissue. This may at times be impossible, however, and then we must resort to its destruction with lunar caustic, zinc paste, the application of fuming nitric acid, the electric cautery, and the like, or the use of the toxins and X-rays. All such measures are, however, unsurgical and unreliable, and should be "cast as rubbish to the void," whenever the knife, scissors, sharp spoon, or other sharp methods are possible.

XLIX.

SUPPOSED CAVERNOUS SINUS THROMBOSIS.*

BY EWING W. DAY, M. D.,

PITTSBURG.

Aside from the desirability of reporting obscure cases involving the cranial cavity, that each may add its share to the existing knowledge, it is also well to confess our manifold mistakes and errors, as well as to cry abroad our achievements. In both the following cases the first diagnosis was wrong, and the final diagnosis was proven only in the second case and, from these facts, they present several interesting points.

Harry H., aged 11, was admitted to the Children's Hospital on the evening of January 7, 1901. Family history negative. The previous history of the child, so far as could be ascertained, was that ten months previous he had had measles, and four months ago an attack of typhoid fever. On admission to the hospital the child was very anemic and emaciated. He had had purulent discharge from the right ear for the past eight months. This discharge had been gradually becoming more profuse. The glands in the right cervical region were enlarged and tender to pressure, and over the right mastoid a sinus leading into the middle ear was discharging pus. The temperature of the child on admission was 103; pulse, 120.

As the patient presented all the symptoms of septic infection an immediate operation seemed advisable. He was operated upon that night at 10 p. m., with the assistance of Drs. Ewing and Milligan, and the mastoid freely opened. It was found to be broken down and filled with necrotic bone, granulations and pus. The swelling below the mastoid was punctured with a large aspirating needle but no pus obtained. The lateral sinus was free from involvement.

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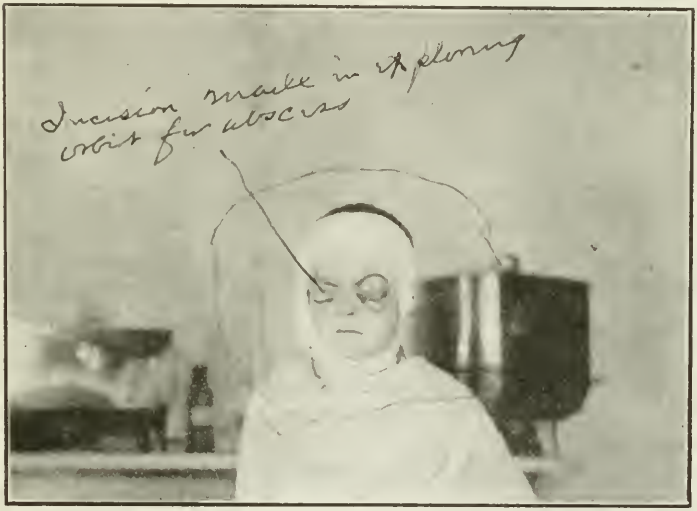
*Read before the American Laryngological, Rhinological and Otological Society, Washington, June, 1902.

The wound was dressed and the next morning his temperature had fallen to $97^3/_5$; but by evening had risen to $100^1/_5$. On the second day his temperature went to $104^2/_5$. It being evident that all of the pus had not been evacuated an incision was made through the swelling in the neck and a pocket found containing a large amount of pus. This was evacuated, drainage tubes were introduced, and the wound again dressed. For the next two days the temperature, as a result of septic absorption, ranged from $104^2/_5$ to normal, with slight chills.



On the morning of the 12th the patient's right eye was found swollen, the lid slightly discolored, and the tissue tense from pressure. The next day the discoloration had increased. All movements of the eyeball were lost, it being held rigid by the swollen tissues. The lids could only be partially closed.

The eyeball was pushed forward by pressure from behind. At consultation Dr. Robinson made the following report after examination of the eye:

The conjunctiva of the right eye was chemotic—the lids edematous, cornea clear, the eyeball protruded and limited in its excursions—the pupil was semi-dilated, but reacted to light stimulus. With the ophthalmoscope the ocular media were all clear and transparent: the optic disc and the retinal vessels were readily seen and presented no gross abnormalities. There being no conjunctival nor corneal infection and the ophthalmoscopic examination excluding panophthalmitis. The ocular symptoms were believed to be due to retro-bulbar pressure. Accordingly an incision was made into the orbit and the orbital cavity thoroughly explored for a tumor or abscess—neither was present, the orbit being completely free from pus. This incision temporarily relieved the tension on the globe.

There was but little blood from the incision and this of a venous nature. The diagnosis of infective thrombosis of the cavernous sinus was made. The patient was closely watched and hourly temperature readings taken for the anticipated septic changes.

The temperature on this day had fallen, and the general condition of the patient seemed improved. On the 16th, or 4th day since the eye involvement appeared, the discoloration in the upper lid had increased and a gangrenous area about the size of a dime was formed on the lid below the line of the incision. The swelling was so great that at no time could the condition of the muscles of the eye be determined as to involvement of the several nerves. On the 19th the temperature reached 104 degrees for a short time, but on the whole there was a noticeable improvement in the patient. On the 22nd the gangrenous patch below the incision was sloughing. Ulceration and sloughing of the cornea began with a free muco-purulent discharge, caused by the pressure, together with the lack of protection from the lids.

The patient's temperature was varying from 100 to 103, with a rapid, thready and weak pulse requiring the free use of stimulants. On the 25th, or 13 days after the first involvement of the right eye, the left eye had commenced to swell and the lids to be discolored as in the right eye. Ophthalmic examination of this eye, made by Dr. Curry, was a duplicate of that of the first eye involved, made by Dr. Robinson. It was also impossible to determine the condition of the muscles of this eye on account of the great distension of the tissues. On the 28th the swelling in the left eye had increased; in the right eye it had decreased. The mastoid wound and the neck during this time were granulating slowly, and there was some purulent discharge from the neck. The temperature was now near the normal mark, though the patient was very weak and showed signs of exhaustion. The tissues around both eyes seemed gangrenous. On February 2nd, the swelling in the right eye was decreasing, in the left eye was increasing, and the cornea sloughing; a purulent discharge was now present. The general condition of the patient was fair. Temperature nearly normal, pulse from 112 to 140.

This state of affairs continued until February 26th, when the temperature arose to 105, the patient complaining of pain over and below the mastoid wound. This old wound, which had been allowed to close, was again opened by Doctors Ewing and Milligan and thoroughly curetted, a quantity of pus evacuated and some necrosed bone removed.

For the next eight days there was a gradual lessening of the temperature variation until on March 6th it passed to the sub-normal line.

The patient at this time was extremely emaciated, his weight being 44½ pounds. There was total loss of sight in both eyes. The ulceration of the cornea of the right eye had been so far controlled that the eyeball had not ruptured, but the left orbit had collapsed, and there was still a free discharge of pus from the orbital cavity.

The patient from this time until the date of his discharge slowly gained in strength, and the temperature never rising above 99. He was transferred to the Blind Asylum May 27th. The mastoid wound was healed, the right eye somewhat shrunken, the cornea covered with scars, probably the cause of blindness in this eye. The left eye collapsed, and the conjunctiva and iris could be seen deep in the socket.

In making a diagnosis of this case, our first impression is that we have to deal with thrombosis of the sinus of an infective nature. The fact that the boy had a purulent mastoiditis, though there was no involvement of the lateral sinus, made us conclude that in some way the purulent infection had been transmitted by some other route to the sinus which seemed so clearly involved.

The case presents many variations from typical cavernous sinus thrombosis.

Between the involvement of the first and second eye a lapse of thirteen days occurred, the usual time being over forty-eight hours.

In infective thrombosis in this locality we would necessarily have marked systemic manifestations. Here, however, the high temperature with its wide variations was wanting, and there were none of the signs of pyemia that did not improve when the mastoid was evacuated; moreover. infective thrombosis of this locality is invariably fatal.

The fact that this case recovered is enough of itself to prove that the thrombosis could not have been of the septic order. If a thrombosis was present it must have been a primary or non-infective one.

One point is especially interesting, that in the symptoms the chronic purulent otitis media was supposed to be a very important causative factor, but it proved in the end to be a coincidence without significance.

Edema of the lids, conjunctival chemosis, fixation and protrusion of the eyeball are symptoms seen in tenonitis, abscess of the orbit, panophthalmitis and thrombosis of the cavernous sinus. The ophthalmologists, Doctors Robinson and Curry who attended to his eyes throughout the disease, stated positively that tenonitis and abscess of the orbit were not present, that there was no panophthalmitis prior to the ulceration and sloughing of the cornea, but may have been present later from absorption through the abraded surface.

Primary thrombosis in the cranial cavity is almost always in the longitudinal sinus; rarely in the lateral and still more rarely in the cavernous sinus and occurs mostly at the extreme of life. The clots are resistant, dense, stratified, and non-adherent to the walls of the vein. They show a marked tendency to be organized or absorbed, and very rarely disintegrate.

The symptoms of primary thrombosis are often uncertain and are prone to be masked by the disease which precedes and which is the cause of the trouble.

The diagnosis is dicffiult and is seldom definitely determined during life. There are none of the characteristic symptoms of temperature which are found in infective thrombosis.

When the thrombus is located in the cavernous sinus, though one sinus is affected at the outset, yet thrombosis in the majority of cases spreads through the circular sinus to the cavernous sinus on the opposite side. The symptoms, though unilateral to start with, later become bilateral.

The sinus in which the symptoms are first noticed, as shown by the exophthalmos, may be partly restored, while the opposite side becomes markedly affected. This alteration of the seat of the symptoms is diagnostic between abscess of the orbital cavity and cavernous sinus thrombosis.

There are two principal groups of symptoms generally present; one dependent on venous obstruction, and the other on a paralysis due to the pressure on the nerves supplying the cavernous venous plexus.

In considering the symptoms of this case, we have a patient who had within ten months passed through measles, typhoid fever, and sepsis from a purulent mastoiditis and abscess of the neck, producing an exhaustion favorable to the forming of a primary clot.

The symptoms were first marked exophthalmos, of the right eye; great edema of the eyelids and the corresponding side of the root of the nose. There was an absence of any characteristic temperature symptoms.

It was impossible to determine whether there was paralysis of the 2nd, 3rd, 4th, 6th, or the first division of the 5th nerve, on account of the great edema and the distension of the tissues.

After 13 days the second eye was involved rapidly, causing the same symptoms and appearances that were present in the first.

Coincident with the appearances in the second eye, there was a subsidence in the first eye affected. The implication of the second eye, if too long an interval does not intervene, is very indicative of thrombic extension to the opposite cavernous sinus.

While, as we have said, the diagnosis is unproven, still the writer believes the following is the most probable one: That in the beginning we had a primary thrombosis of the right ophthalmic vein, which slowly extended back to the right cavernous sinus and then to the left sinus and terminated in absorption or organization of the clot.

L.

TUMOR OF CEREBELLUM.*

By Ewing W. Day, M. D.,

PITTSBURG.

Alpha M., aged 7, was admitted to the Children's Hospital. April 18, 1901. At the time of admission previous history was not obtainable but will be given in proper place. The father and mother were full cousins. They had a family of five children. An elder sister of the patient was "not bright." A young brother was hemiplegic. The child had chronic otitis media of both ears at intervals since infancy. In October of 1900, the patient was subject to headaches, coming on at variable intervals. These attacks were very severe and would last for hours. When the pain was at its height there was some convulsive contractions of the muscles of the body. This would be followed by vomiting, after which the patient would fall into a deep, heavy sleep. The left ear at this time began to discharge pus, with occasional slight earaches. The temperature was slightly subnormal. Pulse 75 to 85. These symptoms continued until his admittance to the hospital. In January there was noticed a failure in vision and a slight staggering in his walk.

Condition at time of admission: The child was well developed, though emaciated. Severe headaches, referred mostly to the frontal region. The hearing in both ears nearly normal. Right ear, no discharge. Tympanic membrane destroyed and the presence of necrosed bone in the tympanic cavity determined. Left ear, same as right, but a free purulent discharge present. No swelling over mastoid but some tenderness on deep pressure. Percussion also caused the patient to flinch.

There is no paralysis except of the sixth nerve on the right side. Knee jerks normal. There is a slight but distinct staggering and swaying in walking. Patient cannot see a pin dropped on the floor before him, but has to grope for it. Percussion over the coronal suture on both sides of the median line brings out a distinct cracked-pot sound but causes no pain.

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*Read before the American Laryngological, Rhinological and Otological Society, Washington, 1902.

Examination of the eyes: Patient has a convergent strabismus. Right eye, external rectus shows some weakness and the excursion of the eye is limited outward. The strabismus is very noticeable but not complete, the external rotators have some power. The pupils are equal and react promptly to light.

Ophthalmoscopic examination: Right eye, media clear. Disc shows a decided optic neuritis, apparently subsiding. In macular region are many white spots, very similar in appearance to albuminuric retinitis. Vessels in retina are tortuous and in places obscured. Left eye same as right.

Urinary analysis: Color clear. Reaction acid. Specific gravity, 1020. No albumin. No sugar. No casts.

The temperature was normal, and pulse 96.

In considering the history of the case at this time we had the following prominent points: (1) Age. (2) The purulent discharge from both ears during entire life and some tenderness over left mastoid on percussion. (3) Optic neuritis. (4) Paralysis of sixth nerve on right side. (5) Cracked-pot sound over coronal suture. (6) Slight staggering gait. (7) Severe headaches.

In making a diagnosis, lack of detail in the previous history was regretted. The only symptom that we might not expect to find in meningitis, cerebritis, syphilis, hemorrhage, or tumor, was purulent otitis media and to this great importance was given and the diagnosis of an abscess of the cerebellum on the left side was made and operation advised.

Operated upon May 20th. The usual mastoid incision and flap to uncover skull for trephining the cerebellum was made. The mastoid was opened and found normal. The skull was trephined over center of left cerebellar lobe. The dura and brain substance appeared normal but bulged somewhat into the trephine opening. The trocar was passed in different directions well into the lobe, but with negative results. The wound in the scalp was closed with sutures. The patient for the following week did nicely and seemed to experience no bad effects from the operation. Temperature below 100, and pulse averaging 110.

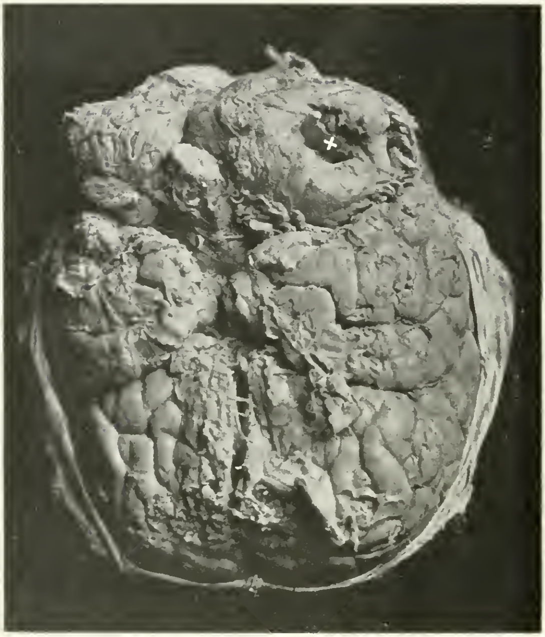
On May 30th there was a sudden rise of temperature to 104 $^{2}/_{5}$. Patient was very dull and stupid. A swelling with fluctuation was found over the trephine opening. This was opened, and some broken down brain tissue and clotted blood removed. A cerebellar hernia was present. The patient's condition from this time until his removal from the hospital changed but little. He was dull and stupid, and when aroused was cross and fretful. The hernia slowly increased in size. The headache was not present after the operation. By June 10th, complete optic atrophy had taken place in the left eye, and right eye progressing rapidly. June 18th was removed by parents. Patient was very dull and hard to arouse. When aroused would take nourishment freely.

After June 10th, the temperature was mostly subnormal, at one time reaching 96. Pulse from 75 to 100.

On May 6, 1902, or nearly a year after the operation, I was permitted, with Doctors Irons and Mayer, to again examine the case. Since leaving the hospital the patient required attention like an infant. There was very pronounced hydrocephalus, the head having increased greatly in size. There was spastic paralysis of right and left leg and left arm, with increased reflexes and general clonus, most marked on left side. Cracked-pot sound over both sides of coronal suture, but percussion produced pain over right side. Over the old trephine site there was a hernia an inch and one-half in diameter. Sensation, speech and organic reflexes were apparently normal.

On May 16th, there was a rise in temperature to 102 and pulse rate to 120. From this time until May 20th, there was a slow, but steady increase in both temperature and pulse. The temperature reached 106 $^{1}/_{5}$, pulse very rapid and thready, and death followed in a few hours.

On turning back the scalp, the formation of a new bone along the lines of the principal sutures was marked, averaging one inch in width. The sutures were very loosely united, making the removal of the skull-cap, in one piece, difficult. The dura was adherent along the new bone formation of the sagittal suture. There was some softening



X, Section removed for examination.

of the frontal lobes, with fluctuation on palpation, due to the fluid within. In removing the brain from the skull it was impossible to prevent the escape of a large amount of the cerebro-spinal fluid, which, unfortunately, was not measured. The greater portion of the left cerebellar lobe had been forced through the old trephine opening, to which the scalp was adherent.

A tumor the size of a hen's egg was found in the right cerebellum, apparently arising from the middle of the lower surface of the right lateral lobe. It was confined to this lobe and did not involve the middle lobe or the cerebellar peduncles. The medulla was turned on its axis, nearly one quarter of a turn, by the pressure of the tumor. The lower middle lobe of cerebellum was softened. The left cerebellar lobe was atrophied to some extent from pressure.

The right sixth nerve was probably paralyzed by the tension put upon it.

The aqueduct of Sylvius was enormously dilated. The foramen of Majendie was closed by pressure and by adhesive inflammation, thus causing the internal hydrocephalus. The great distention of the ventricles does not show in the specimen on account of their collapse, due to the action of the hardening fluid.

LI.

A FOREIGN BODY IN EXTERNAL AUDITORY CANAL SIMULATING A SEQUESTRUM.

By W. H. Roberts, M. D.,

PASADENA, CAL.

Henry B., aged 6 years, was brought to my office September 18, 1901, suffering from earache of right ear. This ear had been aching for two days. He had suffered with more or less pain in it for three years and occasionally it had discharged pus. Examination was difficult, owing to extreme irritability of the child.

The canal was full of creamy, foul-smelling pus. This was removed by mopping, and after getting the canal as clear as possible, I noticed a grayish-brown object at about the site of the drum. This filled the canal from above down, leaving spaces along the anterior and posterior walls through which exuberant granulations presented, one anteriorly being decidedly polypoid. These granulations bled freely upon the slightest touch.

I tried to remove the dark colored object, thinking that possibly it was a flaxseed, though I could obtain no history of anything having been introduced into the canal, but as the child screamed with pain whenever it was touched, I was obliged to desist. I then came to the conclusion that this must be a remnant of the drum membrane in a necrotic condition, from its long continued bath in pus. After insufflating a little boracetanalid I sent the child home, leaving the removal of the granulations for another day.

The next day the mother reported absence of pain. There was very little pus in the canal but the granulations had grown so rapidly as to almost conceal the so-called drum.

After a few days, during which time the granulations had entirely closed the canal immediately external to the drum (?) I attempted to curette the granulations under chloroform. The hemorrhage was so profuse, not being in the slightest controlled by the solutions of adrenalin chlorid I then had in my office, that I was unable to accomplish much of anything.

When next able to make a satisfactory examination, I noticed what appeared to be a sequestrum, triangular in shape, the apex rising from the floor of the canal, pointing outward, movable, but so sensitive as to make removal impossible even under 10 per cent. cocain.

Thinking this object a sequestrum which I had caused to change position in the attempted curettement, I decided to remove it and all caries as well under an anesthetic. Dr. E. W. Fleming now saw the case in consultation and tried to remove the sequestrum (?) and failed. He agreed with me that an operation was necessary and that it should be as radical as was indicated after removing the sequestrum.

Two days later the child was admitted to the Pasadena Hospital. Under chloroform, administered by Dr. D. A. Conrad and assisted by Dr. E. W. Fleming, the operation was undertaken.

The canal was thoroughly douched with 1-3000 bichlorid, dried, and then I applied 1-1000 adrenalin chlorid which gave me a nearly bloodless field during the entire operation.

With a strong pair of forceps I grasped the sequestrum (?) firmly and removed—a triangular piece of cork! It measured about 1/2 an inch from base to apex and about the same across the base.

I then thoroughly curetted the granulations and found a practically normal drum. The site of the granulations I cauterized with carbolic acid followed with alcohol. The boy made a prompt recovery and has perfect hearing. He recalled having put a piece of cork in his ear several months before.

The points of interest in this case are:

1. The misleading history.
2. The discharge and granulations which with the difficulty in keeping the boy still long enough to make a careful examination made it practically impossible to make one.
3. The apparently intense pain caused by even touching the foreign body.
4. The fact that the drum membrane was uninjured and the great depth at which it was placed, being unusually far in for a child of his age.

LII.

SOME OBSERVATIONS ON OPERATIONS FOR MALIGNANT DISEASE OF THE MOUTH AND NECK.*

By George W. Crile, M. D.,

CLEVELAND.

The operation for malignant disease of the neck and mouth are based upon certain fundamental principles—the dangers may be classed as immediate, consecutive and remote.

The immediate, or operative dangers are shock and collapse; the consecutive danger is infective inflammation, especially pneumonia; the remote is the recurrence of the disease. Among the causes of shock and collapse, hemorrhage is prominent, not so much the hemorrhage from the larger vessels but the ever present oozing from the smaller. This form can be prevented only by definitely controlling the arterial supply.

Temporary closure of the internal carotid or temporary, or permanent closure of the external carotid minimizes the loss of blood.

Permanent ligature of the internal carotid as a routine measure to prevent hemorrhage during operations is not available since it carries with it a mortality rate of about 11 per cent. on account of cerebral complications. This method would cost more lives than it would save. Permanent ligature of the external carotid is available in the cases in which that artery may be reached without partially performing a tumor dissection in advance. In such cases two principles are violated. First, the tissue of malignant tumors should not be subjected to greater manipulation nor closer dissection than is absolutely necessary for their removal on account of dissemination. Second, there will be unpreventable loss of blood in reaching the artery. It follows that in cases in which ligature of the external carotid owing to the position of either of the primary or the metastatic growth, involves more than the minimum loss of blood or more than the minimum manipulation of the tumor, temporary closure of the common carotid should be done. The unilateral anemia of the neck, face and mouth thus produced gives other advantages quite as important as preventing the loss of blood. The field of operation is kept clear, dissection may be made correspondingly more precisely and more quickly and the entrance of blood into the respiratory tract obviated. Certain operations that are most difficult are converted into cadaver dissections.

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*Read at the 34th annual meeting of the Minnesota State Medical Society at Minneapolis, June 19, 1902.—From the St. Paul Medical Journal.

The writer has closed the carotid arteries 32 times since 1897 and has observed no unfavorable side effects. As a means of controlling arterial and capillary hemorrhage it is absolute.

The artery should be subjected to only sufficient pressure to approximate its walls. More than that is alike unsafe and unnecessary. Closure of the lumen requires but little pressure. Caution against a greater pressure must be emphasized.

The facility and accuracy of dissection of the bloodless field, especially, in the region of the important vessels and nerves, and more particularly in the dissection within the mouth is so much facilitated that more extensive operations may be safely done.

Next in the group of operations in the causation of shock and collapse is direct or reflex inhibition of the heart or of the respiration.

This is due to mechanical interference with the vagus or its branches, notably the superior laryngeal; while the trunk of the vagus may be considerably manipulated without producing changes in the heart or the respiration, the superior or laryngeal either in its terminus or the mucous membrane of the larynx or in its trunk causes reflex inhibition on even slight manipulation.

The effect upon the heart may be wholly avoided by administering a physiologic dose of atropin prior to operation, but there is no drug known whose constitutional action prevents respiratory inhibition.

Cocain locally applied either upon the trunk of the superior laryngeal or upon the laryngeal mucosa, prevents reflex inhibition of the respiration and the circulation.

The intra-laryngeal use is practical; the application upon the trunk is rarely so. In the deep dissection in the angle formed by the ramus of the jaw and the mastoid, slowing of the pulse and slowing or cessation of respiration is sometimes observed. This is more particularly true in difficult dissections in close fitting tumors, necessitating correspondingly greater mechanical disturbance of the superior laryngeal nerve.

In a number of cases I have had simultaneous observations made upon the respiration, the pulse, and the blood pressure. These agreed perfectly with the experimental data, viz.: the respiration and the pulse were both slowed and the blood pressure fell.

The conventional standard for judging the state of the patient is the rapidity of the pulse and its volume and tension. There is under these circumstances good opportunity for misinterpretation. As an illustration, a patient in reduced health is undergoing an extensive neck operation. The pulse may have gradually arisen to 140 or 150, and the deeper angle between the ramus of the jaw and the mastoid remains to be dissected. During its dissection the pulse may drop to 130, then to 120, then to 110 and is of good volume. Almost any anesthetizer would consider his patient improving, yet during this time the sphygmo-manometer would show that the blood pressure is falling, perhaps rapidly falling. The respiration becomes simultaneously slowed, perhaps fails.

However, after the operation is concluded and all inhibitory influences are removed the pulse becomes rapid, of small volume, and low tension.

The immediate correct interpretation of these changes is of great importance to the operator so that he may conduct the operation accordingly.

In the cases in which the operation involves a considerable amount of vagal manipulation, or its resection, it is well to inject cocain into its trunk distal to the point of severing. I have made unilateral resection of the vagus five times. It did not complicate the case more than to increase the pulse rate several beats per minute and to produce permanent hoarseness. Pneumonia did not develop.

Bilateral resection is not to be considered. In all the operations extensively involving the vagi, the tendency to respiratory failure is marked. This is best met by alternating applications of ice and heat upon the abdomen or chest, with artificial respiration in extreme cases.

These then are the more important immediate dangers of this class of operations. Their prevention will go a long way toward controlling the most important consecutive danger—viz:—infective inflammation of the respiratory tract.

One of the principal causes of infective inflammation of the pulmonary tract is the entrance of blood in the operation. This may be wholly avoided by temporarily closing the carotid, and by posture. It also lessens the duration of the operation, which in addition to the lessening of hemorrhage leaves more vitality to resist post-operative infection. Death may be caused by toxemia alone in the cases in which a considerable amount of blood has gained entrance into the pulmonary tract.

The inhalation of infective wound discharges, if no blood has been previously inhaled, is not nearly so likely to produce an infective inflammation as in the cases in which blood has been inhaled.

If the patient is kept well upon his side and the mouth cleansed as often as any fluid appears, providing this is done by a nurse experienced in this class of cases, so as to insure against undue annoyances, the danger of infective inflammation is slight. This introduces the question as to the advisability of a preliminary tracheotomy. This operation somewhat reduces the patient, and usually causes on its own account some inflammation, occasionally fatal. It prevents the patient's assisting in cleansing his mouth as effectually as he otherwise could. It is always attended by a considerable irritation and usually some coughing. Its advantages must be very considerable to compensate for its disadvantages. In certain operations in which the uppper respiratory tract is occluded, tracheotomy is imperative.

I use preliminary tracheotomy less frequently than formerly. It gives an advantage in operations so far back in the throat that the wound is not easily accessible for cleansing, and its immediate and natural drainage is into the larynx.

In all the cases in which, by the nature of the operation, pneumonia is probable, I have treated them as though it were sure to occur. The patient's chest is covered with a pneumonia jacket, the air of the room is moist and warm, and the patient is placed in the sitting posture early, especially in the cases of elderly subjects. If possible, he is propped up or gotten up at least part of the time from the beginning.

In the extensive mouth operations food and water should be given either per rectum or through a small tube introduced into the esophagus.

A male catheter serves this purpose very well. In the cleansing and the feeding, the use of a spray in which there is a sufficient amount of cocain to relieve the tenderness, is useful.

The final result will be permanent cure if all malignant tissue is removed.

In all cases the removal of the cervical glands in the region of possible metastases should be none the less vigorously done than in cancer of the breast.

The technique may perhaps be best given by describing an operation performed a little more than three years ago upon a patient 51 years of age, for a cancer of the floor of the mouth, involving the inner aspect of the jaw, the border of the tongue with metastases in the sub-maxillary and the deep cervical lymph glands.

Twenty minutes before the operation he was given a hypodermic injection of 1-6 of morphin, and 1-100 atropin.

The common carotid and the internal jugular vein were exposed just above the clavicle. The vein was ligated in two places and severed between. The artery was closed during the operation by means of the screw clamp. The incision was then extended upward to a point half an inch below and anterior to the angle of the jaw: from this point lateral incisions paralleling the ramus and the body were continued. The skin was then reflected sufficiently to expose the gland bearing area of accomplished or of possible infection. The sterno-mastoid muscle was found adherent to the underlying cancerous glands. It was then severed at its lower end on a level with the point of division of the internal jugular vein. Starting below, the internal jugular, the deep and the superficial fascia, the sterno-mastoid, the platysma, the submaxillary salivary gland, all the soft parts from the deep plane of the neck behind and all the cervical glands including all the gland bearing tissue, were separated from below upward—no attention was paid to individual glands. When the jaw was reached, the part involved was resected by sawing through at two places from the outside, the tongue was split longitudinally, the corresponding side of the floor of the mouth was separated from its attachments; the entire mass including the portion of the tongue, floor of the mouth, portion of the jaw, submaxillary salivary and lymph glands, muscles, facia, metastases, deep and superficial cervical lymph glands, jugular vein and other soft parts all were removed in a block. The amount of hemorrhage was but trifling the duration of the operation short. The patient made a good recovery, and after more than three years has had no recurrence.

In summary: The principal dangers of operations for malignant disease of the mouth and neck are the immediate, the consecutive and the remote.

The immediate or operative dangers are shock and collapse. They are caused by hemorrhage, too long duration, too much manipulation, reflex and direct inhibition of the heart and of the respiration. These may be largely prevented by an absolute control of the arterial blood supply by temporarily closing the carotid artery by preliminary injection of atropin, supplemented when possible with local applications of cocain.

The principal consecutive danger is infective inflammation, particularly septic pneumonia. This is most effectively obviated by a definite control of the blood supply to avoid the entrance of blood into the pulmonary tract and shortening the operative time. In certain selected cases tracheotomy is helpful.

After the operation the greatest reliance must be placed upon warm, moist air, careful feeding, constant care of wound, posture, and special nursing until granulations appear.

The ultimate cure depends upon the stage at which the disease is attacked and the thoroughness of the operation. The removal of individual glands is clinically unsuccessful. Especial emphasis is placed upon the advantage of removing all the gland bearing tissue in which metastases may occur *en bloc*, beginning at the distal point. both because it is the point of advantage in the attack, and because thereby the avenues for dissemination are effectively closed.

LIII.

PHARYNGITIS LATERALIS HYPERTROPHICA.

By Fred Baker, M. D.,

SAN DIEGO, CAL.

Pharyngitis lateralis hypertrophica is a disease covering a very small field, but of great importance, not because inflammation of the lateral bands ever cause, any danger to life, but because it is a persistent chronic trouble, the symptoms of which are annoying enough to make life very miserable.

The literature of the subject has a curious history. From the early seventies, when Solis-Cohen gave us what was probably the first rational explanation of its pathology to the present time, its existence as a distinct pathological entity has been denied by good authorities; others have made no mention of it, or only casual ones, in their treatises, and I know of no full study covering the ground as it deserves.

Pharyngitis lateralis hypertrophica is as often described under the general term pharyngitis hypertrophica as any other, and some authors in describing the disease omit all specific mention of the lateral bands. Herein they miss the keynote to the whole condition, and this gives us the explanation of their misunderstanding of its pathology.

The tonsils are circumscribed in a really remarkable manner by the pillars of the fauces. It is indeed wonderful how often it is true that the inflammation of a severe tonsillitis does not cross these apparently arbitrary lines to any great extent. Just back of the posterior pillar on each side, and often completely hidden from view by it, is another mass of lymphoid tissue, extending in extreme cases from the level of the lowest lobe of the tonsil, up to, and around, the edge of the soft palate, the authorities say to a union with a similar mass near the mouth of the Eustachian tube, and even with the post-nasal adenoid mass when it exists. This is the lateral band proper, probably always markedly present in young children, and undergoing with age the same degenerative changes as the other lymphoid masses of the nose and throat. Studded over the posterior aspect of the pharynx are several other detached masses of lymphoid tissue generally of small size.

Basing my opinion on my own clinical experience, I am much inclined to doubt a true connection ever existing between the lateral bands proper and the Eustachian or post-nasal tonsil. While a general inflammation of all the throat tissues is not uncommon, I have frequently seen an inflammation entirely localized in the lateral bands, and yielding so promptly to treatment directed only to them, that I believe they are as truly circumscribed as the tonsils themselves. And here is the commonest source of error in the consideration of the pathology of this disease. The lymphoid masses on the posterior median surface of the pharynx are absolutely distinct from the lateral bands, yet it has been common to describe as granular pharynx any perceptible thickening of either or both groups of tissues, thus covering two distinct pathological conditions with an extremely different chain of symptoms. Indeed the subjective symptoms of simple chronic granulations of the posterior pharyngeal wall between the lateral bands are almost absolutely nil, while inflammation of the lateral bands is often one of the most distressing conditions with which we ever have to deal.

The symptoms fall rather easily into three groups—objective, subjective catarrhal, and neurotic or reflex. Objectively we find some swelling of a portion or the whole lateral band. The trouble may be unilateral or bilateral, with much or little superficial redness. Naturally there is immense difference in the amount and distribution of lymphoid tissue in the nose and throat, and we meet all conditions from the extreme adenoid case with large tonsils, much thickening in the vault of the pharynx, the lateral bands half as thick as the little finger, and lymphoid tissue apparently peppered on everywhere where it will stick, to the adult with atrophied tonsils and no other lymphoid tissue apparent on inspection. Therefore we frequently meet cases where a determination of actual disease of the lateral bands must depend more on subjective than objective symptoms, and even cases which we must diagnose by the results of treatment as we formerly diagnosed malaria with quinin, often a very easy procedure, and practicable within a few minutes.

The subjective catarrhal symptoms are frequently not very definite, the history of a cold and slight increase of mucous discharge from the back of the throat. In my judgment all the subjective neurotic symptoms have not yet been reported. Few portions of the body exhibit a chain of reflexes more varied, distressing or complex than the lateral bands. Some of these symptoms, more or less of which may be present in any given case are, a persistent, sharp, barking cough, hoarseness, and more particularly weakening and easy-tiring of the singing or speaking voice, an uncontrollable desire to swallow frequently, pain located at any point in the throat from the soft palate to the thyroid cartilage, though most frequently at the sides, pain on a line of points just outside the edge of the sternum, reaching as low as the seventh or eighth ribs and simulating pleurisy or pleurodynia, pain extending from the angle of the jaw into the ear, temple and mastoid, often of so severe a type as to simulate middle ear and mastoid disease, pain at the base of the tongue, pain over the scapula and extending down to the arm, and distress in breathing, very apparent to the patient, but never lessening the actual lung capacity, or ability to take a full breath.

This is a varied list, but I believe that in rare cases it may be extended to include any disturbance which can be produced by irritation of the glosso-pharyngeal and pneumogastric and some branches of the spinal accessory, hypoglossal and first three or four cervical nerves.

The extent and variety of irritation, originating as it does in what seems not to be a very sensitive spot, is remarkable, and it seems to me can only be explained along the line of pathology pointed out by Solis-Cohen. The lymphoid masses of the lateral bands surround and overlie some of the main trunks of the pharyngeal nerves and pharyngeal plexus. Congestion of these masses from cold or other causes would cause pressure. An overloading of the lymphoid tissue, or passive congestion from lowered tone of the bloodvessels would account for the chronic character of the symptoms, and explain the results of palliative treatment.

That the reflexes are most largely pneumogastric also seems to me certain, though the other nerves often play a large part. Let us run over briefly some of the nerve distributions which show so close a connection as to bear out the correctness of this deduction, paying attention to the anastomoses and distribution to points which have been noted as seats of disturbance.

The glosso-pharyngeal or ninth nerve is a sensory nerve to the pharynx, to the lining membrane of the middle ear, to the superior laryngeal aperture, and to the basal third of the tongue. It is a motor nerve to the stylo-pharyngeus muscle. It effects communication with the otic ganglion, with the facial and pneumogastric nerves, and with the sympathetic nerve of the neck. In passing, it may be well to note its distribution to the circumvallate papillæ of the tongue, an enlargement of which produces a cough, and many other symptoms identical with the disease under consideration. The pharyngeal branches, from two to four in number, join the pharyngeal plexus.

The pneumogastric or tenth nerve furnishes sensory nerves to the larynx, and in part to the soft palate and the pharynx, inhibitory nerves to the heart and alimentary canal, sensory nerves to the middle ear, and assists in the composition of the plexuses of the pharynx, of the esophagus, and of the thorax and abdomen. It forms communication with the spinal accessory, glosso-pharyngeal, facial, hypoglossal and spinal nerves. The spinal accessory or eleventh nerve, though mostly motor, is so intimately associated with the others as to make its action probable, and its distribution is distinctly to parts affected by this disease. Small branches reach the pharynx and anastomose with laryngeal branches of the pneumogastric. It controls laryngeal phonation. The hypoglossal or twelfth nerve is the motor nerve of the tongue, and aids in depressing the hyoid bone. I have seen no case suggesting its implication in lateral band reflexes, but it anastomoses freely with the other nerves.

These nerves all anastomose more or less freely with the upper spinal nerves, which seem to be frequently active in the reflexes of these cases.

Treatment is radical and palliative. As the symptoms are almost entirely reflex, due to pressure on the pharyngeal nerves, by the congested lateral bands, the relief of this pressure is indicated. The radical treatment consists in burning away these masses by galvano-cautery or by caustic. The palliative treatment is especially the application of a strong irritant over the bands to act as a derivative, which by lessening deep congestion lessens pressure. I have had little experience with the galvano-cautery. The results have certainly been good the few times I have used it. So far as I know, all authorities who recognize the condition agree in recommending its use above all other methods, but I confess to a fear that a free burning may sometimes produce a scar, involving these sensitive pharyngeal nerve trunks. Should such a thing happen I believe the patient would be doomed to continual and incurable throat irritation of a very annoying type. I have seen one case which at least suggests such a possibility. The patient has had the lateral bands cauterized repeatedly, and has been in the hands of some of the best specialists in the world. He suffers constant pain of varying severity, and ever since hearing him tell of it I have believed that the cautery has left some such involvement of nerve trunks.

I use caustic applications, however, very freely, and with good results, so perhaps I am straining at a gnat only to swallow a camel. He who has least experience has little right to be in opposition solely on theoretical grounds.

The palliative treatment is wonderfully satisfactory. The attacks of trouble are usually due to taking cold, over-use of the voice, or indiscretions leading to gouty manifestations. The symptoms are of rather sudden access, and persist if not treated, but generally the distressing symptoms yield very promptly to one, two or three applications of an irritant, such as chromic acid solutions of varying strength, to the lateral bands, and slight care of the general regimen. If patients will report for a few applications with each attack, the condition generally gradually improves, until complete cure apparently takes place. At least, several of my patients have now gone one or more years without recurrence of the attacks. The average aggregate of applications in these cases has not exceeded ten or fifteen, so that in ordinary cases I have chosen to depend on palliative treatment, rather than undertake radical measures which seem to be somewhat dangerous.

The symptom for which relief is most frequently sought is cough. I am much convinced that over fifty per cent. of persistent coughs from all causes are dependent on, or aggravated by inflammation of the lateral bands, elongated uvula and enlargement of the lingual papillæ. Of these the latter is rather a rare disease, leaving a large percentage to be divided, probably not far from equally between the other two.

Another common symptom of this disease is tiring of singing or speaking voice. This is commonly the condition in what is known as ministers' sore throat. It frequently yields very promptly to appropriate treatment. I recall the case of a teacher who became unable to read aloud, who was relieved entirely for six months by two applications of a twenty per cent. solution of chronic acid. After six months more trouble recurred, and two or three applications relieved her for over a year. She recently reported her throat strong and well. Such results have made me willing to forego radical treatment.

The most remarkable case of reflex from this condition which has come under my observation, I reported in the course of discussion before the Southern California Medical Society some years ago. Mrs. S. had visited my office frequently, complaining of throat pain and various reflexes. The most common complaint was of inability to breathe, though the patient could actually draw a full breath by making the effort. With this went the line of painful points down the breast, most marked on the left side. I soon found that the right lateral band, which was always apparently the more inflamed, was actually the less troublesome. This has been a common experience. It frequently seems that a superficial redness simply indicates nature's method of counter-irritation, because such an appearance often goes with little trouble. In these attacks a free application of a twenty per cent. solution of chromic acid would completely remove all distressing symptoms in from one to two minutes. The pain and distress about the chest would leave absolutely, the relief lasting from twelve hours to two days, and two or three applications always terminated the attack.

Near the end of July, 1894, this patient awoke one morning with an intensely painful spot over the left scapular spine, and a feeling that the left arm was congested and swollen. There was absolutely no objective sign of these conditions. The circulation of the left arm was normal, as indeed was that of the whole body. Three physicians saw her, and their diagnosis ranged from rheumatism to angina pectoris. No treatment had any effect, though there had been some slight relief when I saw her about August 10th, three weeks after the initial attack. The patient was spending most of her time in bed, not from the severity of the distress, but because the distress was so constant as to render sitting up very tiresome. I gave the opinion that we had some reflex disturbance to meet, but admitted my inability to locate the origin. The husband was already thinking of sending for Dr. Brainerd, of Los Angeles, and I advised his doing so. Dr. Brainerd being unable to come, I began studying the nerve connections. I found the spinal accessory supplying the trapezius muscle as a motor nerve, and connecting by origin and anastomosis with the cervical nerves of sensation over the same region, and the arm, as well as with the pneumogastric and glosso-pharyngeal. This gave me a direct enough connection to throw suspicion on the lateral bands, which had already shown some queer conditions. Without much real faith, I made two applications to the throat, as I had frequently done before. There was marked improvement after the first, and complete relief after the second. I was still sceptical until the patient came to my office about three weeks later, saying she "had waked with the same symptoms that morning, and now was the chance to demonstrate the truth of my theory." Two applications were followed by complete relief, and I am sure that such a repetition of results demonstrates that the whole chain of symptoms was caused by the swelling of the lateral bands.

In all these cases we have to deal with the neurotic subject, but curiously we rarely see marked symptoms among the young where neurotic vagaries are most startling.

Bosworth presents an explanation of this which I am inclined to accept, though he puts it forward as a theory.

During childhood, the lymphoid development is greatest but the tissues being soft, any amount of swelling does not cause much pressure on the nerves. As the retrograde changes of age come, whatever theory of the process be accepted, the masses become harder, and more tense with the shrinkage. Now any slight change in circulation or glandular activity will result in marked pressure on the nerves, and be followed by intensely distressing symptoms.

Let me conclude with the statement that though I have seen cases presenting all the symptoms here mentioned, I rarely see a new one of any severity, without unearthing some new phase of reflex. Therefore, though I may have bored you with so long a list of symptoms and cases, I feel that I have only begun a study of this protean disease.

LIV.

POLYPI OF THE ANTRUM.

By Robert C. Myles, M. D.,

NEW YORK.

I report the following four cases of antrum polypi on account of the interesting symptoms that were produced by their presence.

The first case was that of a young girl, aged 12. For a long time she had been under the care of several prominent specialists, who, by oversight or carelessness, had not detected the polyp, which was nearly three inches long. It protruded through a large round opening in the wall of the right antrum of Highmore, about where the lower posterior portion of the meatus is situated. There was little evidence of a polyp on inspection through the anterior naris. It passed along under the surface of the middle turbinal and was hidden from view by an edematous inferior turbinal.

The growth was rather slender, and had much the appearance and shape of a ginger root. It passed externally over the posterior end of the inferior turbinal close to the Eustachian tube and rested on the soft palate. The symptoms were peculiar; a full dull feeling around the right eye, a very disagreeable sensation in the rhino-pharynx, and a peculiar muffled voice. She was annoyed rather constantly with expectoration and a desire to get something out of the back of the nose and rhino-pharynx. Her throat was so irritable that posterior rhinoscopy could not be employed. After cocainizing the nose for reduction of the tissue, parts of a glistening body could be detected. A digital examination of the posterior naris detected an oblong, moderately smooth mass. The snare was passed through the nose and the tumor engaged, and then brought through the anterior naris, one and one-half inches, yet remained attached at its base. Under traction it broke close to its attachment within the antrum of Higmore, and as the blood subsequently came from the antrum I passed a malleable handled curette through the patulous opening and succeeded in scraping away parts of the pendulous base which was attached to the roof of the antrum. The patient made a gradual recovery and was happily relieved from all the unpleasant phenomena which had annoyed her for so long. I examined her several months after and found no recurrence, but the large opening remained.

The second case was that of a young woman, aged 32, who was sent to me by her physician on account of the distressing and unbearable pain beneath the right eye and in the temple and ethmoid region. As in the former case the inferior turbinal was rather edematous and the polyp could not be seen during the first examination. After cocain and suprarenal extract had been used, a very small portion of the polyp could be detected beneath the posterior end of the middle turbinal, and this was engaged with a snare, but it seemed to become larger as traction was made, and suddenly collapsed with a gush of at least a wine-glassful of watery fluid slightly tinged with blood. After further pulling the mass gave way, and part of the capsule of a large cyst was extracted. I present the specimen which is somewhat softened by time and the preserving fluid. A malleable handled curette was passed through as in the former case, and a quantity of broken down polyp tissue was scraped from the roof of the antrum. The eye symptoms and pain disappeared at once and the patient expressed herself as being entirely relieved. Several months afterward the pain commenced again, and I passed a curette through the large opening, which had shown no tendency to close, and scraped away quite a quantity of polypoid tissue. This seemed to destroy the growth. When I last saw her before she started for Europe, several months since, and about one year after the operation, she was free from all of the symptoms of which she previously complained.

The third case was one of a young woman, aged 21. She complained of pain in the right eye, fullness in the right side of head, and a full, heavy and unpleasant feeling in the right posterior naris. The polyp in this case could be seen on the first examination. It was snared away and was about one and one-half inches long. The antrum was thoroughly curetted as in the last case. I watched the case for about a month and there was no evidence of a recurrrence. The hole of the antrum was large enough to admit the end of the little finger and it showed no tendency to close.

The fourth case was that of a young man, aged 21, who consulted me on December 23, 1901, having been referred by a physician. He complained of pain around the right eye and distress in the right side of the head, also oppression and difficulty in breathing through the nostril at times. He had been treated by prominent doctors in the different cities of the United States. He was a college boy, but had abandoned his studies and was on his way to Egypt in search of health and relief from his malady. This polyp which I present to you was not visible by anterior rhinoscopy, but the mirror in the throat showed the fibroid-appearing tumor above and over the right Eustachian tube. A cold wire snare was passed through the anterior naris; on traction being made the polyp reached the anterior naris before evidence of tension was made on the base. A malleable handled curette was passed through the large opening in the antrum, which had been made by as in the former case; and the base was curetted as thoroughly as possible. He expressed immediate relief from many of the symptoms, but a certain amount of pain and irritation around the eye remained. This gradually lessened up the time of his sailing, which was about one week after the operation. I have not heard from him since.

These cases present some peculiarities, for example, the hidden position assumed by the polyp on top of the inferior turbinal and beneath the middle turbinal. They were all young people and all on the right side, and two of them baffled the physicians who had charge of them for a time.

EIGHTH ANNUAL MEETING OF THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, HELD IN WASHINGTON, D. C., JUNE 2, 3 AND 4, 1902.

CHARLES W. RICHARDSON, M. D., WASHINGTON, PRES.

FIRST DAY, MONDAY, JUNE 2D.

The meeting was held in the Cosmos Club.

Dr. George M. Sternberg, Surgeon-General, U. S. A., delivered the

Address of Welcome.

He welcomed the Society to Washington as a center of scientific work, and to the Cosmos Club, of which he is the president, as the center of scientific work in the city. He said that he was glad that the physicians in Washington were recognized, as they should be, as true men of science.

Dr. Charles W. Richardson, of Washington, D. C., delivered the

President's Address.

He dwelt upon the university and scientific life of Washington, and the congenial surroundings for scientists. Touching upon the methods of teaching the specialties in medical schools, the opinion was expressed that the plan of compelling instruction in the special as well as in the other branches had led to undue crowding of the curriculum, and had been disappointing in its results. The instruction in the specialties, he thought, should be so planned as to supplement rather than to supplant the major branches, of which they form an integral part. Attempts to turn out full fledged specialists should be promptly checked. Theoretically, the elective system was ideal, yet the tendency in undergraduate life was toward two great narrowing by the elective system, and he thought in the long run the elective student would be overtaken and passed by those who had received a broader education. In the opinion of the speaker it was best to develop the specialist by post-graduate teaching founded upon a broad general education in medicine.

Speaking of the condition of the Society, the President said that there were now 233 names on the roll, and that the section meetings had been better attended than in former years. A new departure has been made this year in the conduct of the annual meeting by establishing a pathologic exhibit.

Aural Bougies.

Dr. George L. Richards, of Fall River, Mass., said that a few years ago he had spoken about the use of aural bougies for the relief of earache and otitis externa. He now desired to exhibit these bougies, which he had had made. They could be done up in tin foil or dispensed in lycopodium powder. After dipping in warm water they are inserted into the external auditory canal. They are composed of morphin, atropin, cocain, carbolic acid and gelatino-glycerin. The following is the formula, which is a modification of those introduced by Gruber: Carbolic acid $^{1}/_{16}$ minim; fluid extract of opium, $^{1}/_{7}$ minim; cocain, $^{1}/_{4}$ grain; atropin sulph., $^{1}/_{14}$ grain; enough water, gelaatin and glycerin to make a proper mass which will readily dissolve at the body temperature. These bougies are the size of a quill and half an inch long. In his experience, earache had been aborted by this means in considerably more than one-half of the cases occurring in children.

Dr. M. D. Lederman, of New York, presented several specimens. The first was a specimen showing

Exfoliation of the External Auditory Meatus,

occurring in a long-standing suppurating case. On removing a polypoid formation this mass had been found lying loose in the canal. After the pus was removed the discharge stopped in a comparatively short time.

A Large Fibromyxoma.

The second specimen was a large fibromyxoma which could not be removed by the snare, but required evulsion. Suppuration ceased after the removal of the growth without any secondary applications. The growth was attached to the attic, and though a large perforation of the drum existed, it healed over under antiseptic treatment.

Foreign Body Removed with Difficulty.

The third specimen was a foreign body (a pebble) for the removal of which several unsuccessful attempts had been made by others. By taking off the auricle the body was removed, and the auricle was then sutured back in place. The pebble could not be seen through the external canal, as the inner third of the canal was filled with granulation tissue which surrounded the foreign body. The probe detected a hard substance through the granulation tissue. Attempts were made to remove the stone through the canal but the pebble had formed a cavity from which it could not be dislodged. After displacing the auricle and removing the granulation tissue the stone was extracted with a dull wire curette. A large perforation in the postero-inferior quadrant existed, together with a dislocated malleus which was also removed. Under antiseptic treatment, healing of the membrane resulted in four weeks.

Dr. Sargent F. Snow, of Syracuse, N. Y., read a paper:

Points of Necessary Prominence in the Treatment of Catarrhal Deafness.

He believed that in chronic cases a good prognosis was warranted in many more cases than it is now given. The secret of success was often to be found in the relief of a constitutional condition by which the Eustachian tube is kept occluded. The best treatment was the introduction of air under pressure, saturated with gum camphor and iodin through the Eustachian tube into the middle ear, but such treatment was out of the question until patency of this tube had been secured. The modern tendency to coddling and improper personal hygiene were serious obstacles to the successful treatment of these cases. Wool and linen mesh were the best materials for the under garments. The living rooms should be well ventilated, and cold baths should be taken regularly. In the few cases in which such baths seem impracticable or undesirable, a partial substitute would be found in brisk, dry rubbing of the skin with a harsh towel. The functional activity of the liver must be maintained.

Dr. C. R. Holmes, of Cincinnati, said that he only disagreed with the author on the question of underwear. Personal experience had showed him that woolen underwear was not the best for the catarrhal subject. Most persons lived in overheated rooms. They could not remove heavy undergarments without trouble or possible danger, while it was very easy to regulate the protection of the body by using light underwear and varying the weight of the outer clothing. He had many times taken persons, both old and young, out of flannel underwear in mid-winter, without any serious inconvenience. During the past year he had adopted the plan of printing rules and detailed instructions for regulating the living of these patients. If the patient would not in this way help the physician the local treatment would avail very little.

Dr. C. Dunbar Roy, of Atlanta, Ga., said that no fixed rules could be laid down which would be applicable to individual cases. He believed that woolen underwear should not be worn in the winter, the changes being made in the outer clothing. The nose was often operated upon when it could not relieve the condition of the ear. Because a nostril was stenosed, was no reason for believing that the deafness would be relieved after the removal of the nasal obstruction. He preferred the use of a solution of menthol and iodin in albolene to the use of vapor in the Eustachian tube. He always made use of a solid silver catheter, bent each time to adapt it to the nasopharynx of the individual case. The condition of the drum membrane as to its pliability and the existence of adhesions should be ascertained before making a prognosis. In lithemic subjects, and in those nervous persons in whom there was a determination of blood to the head on slight excitement, special treatment was required.

Dr. S. McCuen Smith, of Philadelphia, thought it was a mistake to put on heavy woolen underwear in winter, even in places as far north as Philadelphia. The general hygienic treatment outlined by the author was very useful. It had been his habit to make use of a hot shower or douche. There should be placed over the bath tub a frame made of gaspipe, and extending around the entire periphery of the bath tub at the height of six or eight feet. In this way a solid stream of hot water passes the full length of the spinal column. Hot water and cold water are used in quick alternation. By this means the person becomes less susceptible to changes in temperature. Physicians were generally inclined to overlook the value of respiration through the skin. He had not the slightest doubt that auto-intoxication arising from fecal accumulation was often a complication in these cases, and hence he believed in flushing the colon every day for a few days, and then once a week. From two to four quarts should be used for each flushing.

Dr. Max A. Goldstein, of St. Louis, said that from the trend of the discussion so far it would appear that we were now on the eve of finding a method of curing the great bugbear, chronic catarrhal otitis media, yet he was still of the opinion that that much-to-be-desired goal is still a long way off. The hygienic treatment has been well outlined in the paper, but would not be found sufficient in many cases, and often after years of faithful and well directed treatment the discontinuance of the treatment would be quickly followed by relapse. He would like to hear the experience of the members with the local application of dry heat.

Dr. George L. Richards said that he admired Dr. Snow's enthusiasm and wished that some of his cases with chronic catarrhal deafness were so situated that they could be placed in Dr. Snow's hands. Chronic catarrhal otitis media could exist with the nose and pharynx in perfectly normal condition. One great difficulty was that the patients did not seek relief until quite late. Professor Minot had recently announced that he had discovered glands in the Eustachian tubes, a point which might explain some of the intricacies of this subject.

Dr. E. B. Dench, of New York, agreed with Dr. Holmes as to the advisability of changing the outer clothing rather than the weight of the underwear. It had always seemed to him that silk was the worst fabric for underwear, because it quickly became saturated with moisture, and the wearer was therefore exceedingly liable to be chilled upon the slightest exposure to cold. The linen mesh underwear was found to be be very comfortable and useful by many catarrhal subjects. He believed that these cases of chronic catarrhal deafness could be very materially benefited. These patients should be told at the outset that cure was probably out of the question, and that improvement could only be effected by a long course of treatment. Discouraging as were these cases, his experience had been that, in persons who would intelligently co-operate with the physician, the results were encouraging, and even in the worst cases the deafness would increase exceedingly slowly.

Dr. William A. Ballenger, of Chicago, said that he had been almost carried away with the eloquence and logic of the reader of the paper, and while he thought the treatment must, for the most part, be that outlined in the paper, he could not entirely share Dr. Snow's enthusiasm or indorse his favorable prognosis. The reasons for failure were obvious from a study of the pathology. The disease was one in which the mucosa had been hypertrophied, and adhesive bands extended to the drum membrane or the ossicles. Moreover, the pathologic conditions in the Eustachian tube complicated the case. This tube contains considerable lymphoid tissue, which, by hypertrophy, often obstructs the Eustachian tube. Under such conditions hygienic treatment could not be expected to effect a cure.

Dr. D. J. Gibb Wishart, of Toronto, Ont., remarked that the reader of the paper had not insisted upon hygienic treatment alone, but only that it should be given its proper place.

Dr. John A. Thompson, of Cincinnati, said that the preventive treatment should receive consideration. The proper treatment of the nose and throat during the acute infectious diseases of childhood and in typhoid fever and acute articular rheumatism would accomplish much in this direction.

Dr. John O. McReynolds, of Dallas, Texas, indorsed what had been said by the previous speakers regarding underclotning, and heartily recommended the use of linen. The linen absorbs the moisture very much more rapidly than the other fabrics. The linen mesh had served him very well. It was exceedingly difficult in the South to induce ladies to take sufficient exercise because of the hot climate. About the only exercise they would indulge in was swimming.

Dr. Lewis A. Coffin, of New York, quoted a remark once made by Dr. D. B. St. John Roosa in a discussion of this kind, i. e., "Yes, gentlemen, they will all hear, but it will be when Gabriel blows his horn."

Dr. Snow said he agreed fully with those who had spoken regarding the use of thinner underwear in winter than was commonly worn. He had been wearing linen mesh for three years, but in his cold climate he found a light woolen garment necessary for two or three of the winter months. With regard to the use of vapors, he wished to say that by injecting these interruptedly the mobility of the parts seemed to be increased by the manipulation. The auscultation tube should always be used in giving the treatments. Auto-intoxication appeared to have an important connection with many, but not all, of these cases. The sclerosed cases certainly appeared hopeless, but there were a great many more which could be benefited by appropriate treatment. Even in the more intractable cases he was becoming more hopeful as a result of giving daily treatments instead of at longer intervals as formerly.

Dr. Robert Levy, of Denver, Col., read a paper entitled :

The Effect of Climate on Laryngeal Tuberculosis with Special Reference to High Altitudes.

Dr. Arthur G. Root, of Albany, said that he believed tuberculosis was the greatest social problem confronting the human race to-day, and it required a united effort on the part of the profession to solve this vital question. He knew of no locality within the United States to which every case of tuberculosis should be referred, though he knew of a number of places in this country to which certain cases should be referred. Intelligent treatment of tuberculosis would be productive of better results than could be possible attained by any climate alone. It was generally admitted that laryngeal tuberculosis might be primary in a few instances. A case of tuberculosis showing fairly advanced pulmonary lesions, and giving a history of repeated hemoptyses, should not be referred to a high altitude until this condition had improved. The dryness and purity of the air constituted the essential elements. It was safer for the person to gradually reach a high altitude so as to avoid excessive strain. Such climatic treatment combined with the other recognized methods would probably give the best results.

Dr. C. Dunbar Roy said he did not believe that tuberculosis was ever primary in the larynx. He knew of no treatment equal to a suitable climate. Altitude was not all. Dry air was the most important desideratum. Atlanta was situated at an elevation of 1,500 feet, but in that moist climate he had seen cases of tuberculosis get steadily worse, and only improve when sent out to the dry air of Arizona. By one deep strong inhalation of a strong solution of menthol in albolene it was often possible to detect pulmonary tuberculosis in its incipiency. A cooling sensation would be experienced in the lung not involved.

Dr. H. W. Loeb, of St. Louis, said that since hearing this paper he had changed the view which he had previously held, i. e., that it was better for cases of laryngeal tuberculosis to die at home than in Colorado. He had known cases of tuberculosis which had received every kind of treatment at home without improvement, improve rapidly after going to Arizona and receiving no treatment.

Dr. John O. McReynolds said that about two years ago he had resolved not to treat any more cases of laryngeal tuberculosis because, no matter how faithfully he treated them at home, he found they did better in a more suitable climate without any treatment whatever. He had succeeded in getting the best results in an altitude of about three thousand feet on the plains of western Texas. San Antonio had an excellent reputation as a health resort for tuberculous patients, but recent statistics showed that so many such persons had flocked there that the natives were contracting this disease. Experience showed that these patients did absolutely better when away from any other tuberculous patients and with only such treatment as they could carry out themselves.

Dr. G. L. Richards said that he met with many persons afflicted with laryngeal tuberculosis who could not leave home and must be treated to the best of our ability. He had already reported ten cases which were helped and several apparently cured by simple local treatment such as the use of lactic acid and para-mono-chloro-phenol.

Dr. S. MacCuen Smith, of Philadelphia, said that in countries like Scotland, despite the moisture, the results seemed to be as good as in high and dry altitudes.

Dr. Max A. Goldstein, of St. Louis, said that he had sent many patients with incipient pulmonary and laryngeal tuberculosis to the western Divide, and they had returned home with decided improvement in the laryngeal condition. He had treated three cases of laryngeal tuberculosis in St. Louis, occurring in residents of Denver, and despite the treatment they had become worse. They all improved after having been back in Denver about six months.

Dr. Sargent L. Snow said that altitude seemed to act well in a few cases because of the stimulation of the circulation and improvement in the general health. Like Dr. McReynolds, he did not give his cases of laryngeal tuberculosis local treatment, but sent them to a moderate elevation, about two thousand feet, and if they did not do well there they were sent to a higher altitude. Many of his cases had done well in the Catskill and Adirondack mountains.

Dr. M. D. Lederman commended the impartiality of the paper under discussion. He firmly believed the high altitude treatment was very promising. It was doubtful if tuberculosis was ever primary in the larynx. Outdoor treatment was most important, and extensive medication was contraindicated.

Dr. Levy, in closing, said that, of course, no one climate was suitable for all cases. As a rule, the cases developing the disease in Colorado were obliged to seek other climates for even temporary relief. The stage of the disease and the patient's financial condition must always be taken into account before sending him to some special region for climatic treatment.

Dr. D. Braden Kyle, of Philadelphia, presented

The Constitutional Manifestations Due to Infectious Processes in the Adenoid Structure of Children.

He said that this gland structure was known to be particularly susceptible to inflammation, and when this occurred there arose high fever and other constitutional manifestations in children. With the slightest infection of this gland the constitutional symptoms were entirely out of proportion to the local changes. After the removal of the adenoid structure there was very little constitutional disturbance, even though slight local infection should occur. Children having repeated attacks of fever for which no very distinct cause can be found, should be examined, as it would usually be found that adenoid hypertrophy was present. After recovery from an attack the adenoid structure should be removed by curetting, as this prevents the frequent recurrence of these febrile attacks and often makes the child less susceptible to the acute infectious diseases.

Dr. C. R. Holmes said that he had frequently met with these cases, and had found that they often suffered also from tubal catarrh. Sometimes the quantity of adenoid tissue had been so small that operation had not seemed necessary, yet on the removal of this small mass of tissue the tubal disorder had also disappeared.

Dr. Robert Levy said that, with the exception of West, he did not know of any one who had directed attention to this important matter. A case was mentioned occurring in his own experience in which with only a moderate adenoid hypertrophy a fever of considerable duration was quickly controlled by washing out the nose, and a cure effected by removal of this adenoid tisssue.

Dr. J. G. Wishart said that the infoldings of this gland were so deep that the absorbing surface was made very great, and the subject was worthy of considerable attention.

Dr. J. A. Stucky, of Lexington, Ky., said that until a year or two ago he had been inclined to look upon the cases described in the paper as being dependent upon irritation of the alimentary canal rather than on trouble in the nasopharynx. Very frequently the patient was relieved by a mercurial purge, but he had met more recently with a number of recurrent cases, and the removal of a small mass of adenoid hypertrophy had effectually prevented further attacks.

Dr. L. A. Coffin, of New York, referred to a case in which a child was thought to be suffering from malaria, but the usual antimalarial remedies failing to give relief, the nasopharynx was examined and pus discovered, apparently coming from the ethmoidal region. Adenoids had been previously removed from this child's nasopharynx. He was inclined to think that retention of pus at various points explained these cases.

Dr. W. B. Shields, of St. Louis, reported an illustrative case.

Dr. Dunbar Roy insisted upon the use of the post-nasal mirror rather than the finger in the examination of the nasopharynx. Reference was made to a case in which the nasopharynx was occluded by a whitish membrane, causing great obstruction to breathing, but associated with no rise of temperature. Two cultures for the Klebs-Loeffler bacillus were negative.

Dr. C. G. Coakley, of New York, was of the opinion that inspection with the mirror often gave a very faulty idea of the amount of lymphoid tissue present when the latter was situated low down.

Dr. H. W. Loeb said that he had formerly opposed the removal of adenoids unless they occluded the tube or interfered with nasal respiration. He had under observation a child with attacks of otitis media recurring at intervals of a few weeks. There was a very small mass of adenoids, but since its removal there had been no more of these attacks.

Dr. C. E. Munger, of Waterbury, Conn., said that he had been called to see a case of diphtheria because of the great difficulty in breathing. He had removed at once a very large mass of necrosed adenoids, with the result that there had been a quick amelioration of the symptoms. This was the only time that he had operated during an attack of diphtheria.

Dr. Kyle, in closing, said that he had often made an examination for adenoids with a nasal speculum and a small electric lamp in the mouth. Only about once in one hundred and fifty times could satisfactory examination be made in a child by means of the rhinoscopic mirror. He often made use of the finger, and could determine adenoid hypertrophy with it when this was impossible by either of the other methods.

Dr. Francis R. Packard, of Philadelphia, read a paper:

Report of a Case of Rapid Necrosis of the Temporal Bone Following Scarlet Fever.*

Dr. H. W. Loeb, of St. Louis, read a paper entitled:

A Case of Fibro-Papilloma of the Larynx with Unusual Movements.

A woman of thirty-eight years was the subject of the report. The history dated back to an attack of suffocation and dyspnea coming on during the night. Her voice was jerky, but there was nothing about the breathing to indicate laryngeal obstruction. Examination of the larynx showed apparently a tumor on the posterior wall of the infra-glottic portion of the larynx and trachea. As expiration began the tumor appeared, swung around and passed into the supra-glottic portion; then a second tumor appeared and surmounted the first tumor, almost completely hiding the glottis from view. During phonation, as a rule, only the first tumor succeeded in getting above the glottis. Three tumors were first removed by the forceps and a fourth one at a later sitting. It was evident that the tumors had sprung from the inferior surface of the right vocal band, and that their mobility was due to the length of the pedicle.

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*See page 505.

Dr. George L. Richards said regarding the removal of intra-laryngeal tumors under local anesthesia that if one-quarter of a grain of morphin were given about half an hour before the operation it would greatly aid the operator, as the natural reflexes would be much less marked as a result and the local anesthesia intensified.

Dr. John M. Ingersoll, of Cleveland, O., presented:

Spasmodic Torticollis Following Adenotomy.*

Dr. Thomas H. Halsted, of Syracuse, said that he had met with an exactly similar case in which the torticollis had entirely disappeared after nine days without any treatment.

Dr. William R. Lincoln, of Cleveland, Ohio, recalled a case, occurring in a young girl, upon which he had operated for adenoids. The next day the muscles of the soft palate were found to be alternately relaxing and contracting, and inquiry elicited the fact that the child had suffered from chorea some time previously.

Dr. W. B. Shields, of St. Louis, read a paper:

Influenza as a Causative Factor in Inflammatory Diseases of the Respiratory Tract.

In his experience the sinuses most frequently involved were the frontal and ethmoidal, and the affection was sometimes associated with impairment of memory and lethargy. All cases of frontal sinusitis recover without operative interference unless there is pre-existing polypoid hypertrophy or inflammation of the sinuses. The sphenoidal sinus was often affected, but recovery was usually spontaneous. The worst cases were those in which the ethmoidal cells were affected. The laryngitis of influenza was similar to that found in ordinary colds. The most distressing and dangerous cases were those in which influenza attacks the lungs, and this was particularly so in persons showing arteriosclerosis or chronic disease of the lungs. The tendency to tuberculous infection after influenza was well marked.

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*See page 512.

Dr. J. A. Stucky said that he had met with very few cases of influenza which had affected the larynx or the lower portions of the respiratory tract. He had noticed that violent frontal and occipital headache were out of all proportion to the constitutional disturbance. The nose would show perhaps only a slight swelling of the turbinate, and the temperature of the body was apt to be subnormal in the morning and rise to 100 or 101 F. later in the day. Small hemorrhagic spots were frequently found in the drum membrane of the ear. In three cases he had observed loss of smell and of memory following influenza. The majority of these cases could be relieved without surgical interference unless there had previously existed a polypoid degeneration or some other abnormal condition. Because of the prostrating effect of the disease the patient should be put to bed at once. The salicylates combined with the bromides had given him the best results in the constitutional treatment. He avoided the use of opium and of the coal tar products. To relieve the pain he used dry heat or a very weak saline solution of adrenalin, one to eight or twelve thousand. The mistake was often made of using too strong a solution, thus causing excessive reaction. The pain was due to retention of secretion.

Dr. Shields objected to the use of adrenalin in any disease of the frontal sinuses in which there was acute inflammation. He preferred a weak solution of cocain or of eucain.

Dr. Edward B. Dench, of New York, read a paper upon:

Various Operative Procedures for the Relief of Chronic Suppurative Otitis Media and Their Comparative Value.

. In a consideration of the topic he confined his remarks to those cases of long standing in which suppuration had persisted in spite of the ordinary measures for relief. In all cases the cause of the otorrhea was diseased bone within the tympanic cavity. In order to effect a permanent cure it was necessary that all diseased foci should be removed, and that any wound resulting from the surgical interference should be made to heal as quickly as possible in order that all regions previously diseased might be quickly covered with normal epithelium. In cases where the caries was confined either to the ossicles or to the ossicles and those parts of the tympanic cavity which were easily accessible through the external auditory meatus, excision of the ossicles and thorough curettement of the tympanic cavity through the external auditory canal constituted the ideal procedure, both on account of its simplicity and its safety. The author showed both from his own statistics and those of other operators that the simple operation of removal of the ossicles and thorough curettement of the tympanum effected a cure in at least one-half of the cases operated upon and he advised this procedure, provided the cases submitted to the operation were carefully selected. In every case in which this operation was undertaken the author emphasized the necessity of a thorough and complete search for the incus. The reason for this was that this ossicle was most frequently the initial seat of the intratympanic caries, and even though only a small fragment of the ossicle remained, this would be sufficient to keep up the suppuration. It should be remembered that the incus usually lies close to the margin of the tympanic ring. Occasionally it may be displaced into the lower part of the tympanic cavity by the operator in extracting the malleus. The speaker drew attention to the fact that while many operators considered the operation as finished with the removal of the ossicles, it was important to bear in mind that the operation was not complete until all diseased bone had been removed from the tympanum by the thorough use of the curette. Hemorrhage could usually be controlled by packing with sterile gauze strips or with gauze strips saturated in a sterile solution either of adrenalin chlorid or of suprarenal extract. When there was extensive caries of the middle ear it was necessary to thoroughly expose the tympanum and the adjacent cells by the free removal of the osseous walls. When the mastoid cells were also involved, the mastoid antrum was entered as the initial step of the procedure, and the author advised this as the first step in practically every case in which the radical operation was indicated. His custom was to make the incision through the soft parts, 5-16th to 1-2 inch behind the line of the posterior auricular fold. The anterior flap was then dissected forward and the posterior margin of the bony meatus exposed. The author found that if he dissected out the fibrocartilaginous meatus from the bony canal that this membranous tube would rupture posteriorly close to the level of the drum membrane. He favored entering the mastoid antrum through the cortex rather than following the course advised by Stacke of entering the mastoid antrum through the external auditory canal, as the initial procedure. The operator was next advised to follow the upper wall of the external meatus inward and remove the floor of the tympanic vault, thus throwing the tympanic vault and the antrum into one large cavity. The next step was to break down the bridge between the opening already made in the mastoid and the external auditory meatus. This procedure involved the removal of the posterior wall of the external auditory meatus. This should be done freely, the bridge being taken away completely down to the floor of the external auditory canal, as far inward as two-thirds of the canal, that is the outer two-thirds of the posterior wall of the meatus should be removed completely and made continuous with the mastoid opening. It was considered unsafe to remove the posterior wall of the canal to this extent throughout its entire depth for fear of injuring either the facial nerve or the horizontal semicircular canal. If the bone was removed according to the plan already described the horizontal semicircular canal and the aqueductus Fallopii, lying just below it could be easily seen by the operator, and all diseased bone remaining could be removed without injury to those structures. Where the mastoid cells were pneumatic, these were to be thoroughly explored until firm bone was reached. Hemorrhage sometimes constituted an obstacle to the operation, but could always be controlled by firmly packing the cavity with gauze. In some instances the operation was prolonged on account of persistent oozing from the bony structures, but in no case was hemorrhage so severe as to prevent the completion of the operation. The middle ear and mastoid having been thoroughly cleared out, it was next necessary to provide an epithelial lining for the extensive bony cavity thus formed. Such a continuous lining was obtained by forming flaps from the posterior wall of the fibrocartilaginous meatus and from the concha. The exact form of flap to be employed must vary with the individual case. The writer had found that in most cases it was wise not to limit these flaps to the fibrocartilaginous meatus, but to take some tissue from the concha as well in order to secure a larger amount of cutaneous covering for the exposed bone. He had also found that it was of material advantage in most cases, to dissect out the fibrocartilaginous tissue from these flaps, so that the integument might be applied more perfectly to the bony walls of the cavity. There was danger in this operation of injuring the facial nerve, the horizontal semicircular canal, the labyrinth and the lateral sinus. Any of these accidents could usually be avoided by care on the part of the operator. Comparing the results of these two operations upon the function of the organ, the writer stated that the surgeon could generally promise that the hearing would probably not be worse after the simpler operation of removal of the ossicles, but would, in the majority of cases, be improved. The effect of the radical operation upon the hearing was somewhat uncertain. In many cases it remained the same as before the operation. In a few it was made worse and in others the hearing was improved. It was, therefore, wise, prior to the performance of the radical operation, to caution the patient that the function of audition might be greatly impaired as the result of the operative procedure.

Dr. George L. Richards, of Fall River, Mass., presented his paper:

Chronic Suppurative Otitis Media—When Should Radical Surgery be Employed in Its Treatment, and of What Should This Consist?

Out of sixty-four cases of brain and cerebellar abscess he had found 82 per cent. to be the result of long standing chronic purulent otitis media. Out of nine thousand autopsies at Guy's Hospital, the cause of death in two-thirds of one per cent. was chronic suppurative otitis media. The small proportion, however, was no argument for shirking the duty of explaining to the patient that he was carrying around in his head what was equivalent to a charge of dynamite. According to his experience, hearing was generally improved by operation. Ossiculectomy was advised by many aurists as the first operation to be done. Distressing nausea and vertigo often followed this operation, and facial nerve paralysis, lasting several months, was sometimes observed. He therefore preferred in most instances to do the radical operation. It was essential to have good illumination for this operation, preferably that obtained from the forehead electric light. The tympanic opening of the Eustachian tube should not be overlooked in the process of curetting the cavity. Most of his patients had left the hospital in less than two weeks after the operation, and several of them in another week had returned to work. The after treatment, though simple, might last from six weeks to six months.

Dr. S. Macuen Smith, of Philadelphia, advocated the early recognition and treatment of acute suppurative disease of the ear in order to prevent many of these cases from becoming chronic. A very large percentage of these cases could be cured if proper treatment were early instituted. Early incision of the membrana tympani could do no harm, and would often arrest the process before suppuration had begun. His experience had been that in a rather large percentage of cases in which the tympanic operation had been done the radical operation would be subsequently demanded. He preferred the Stacke-Schwarze operation because of the diminished danger to important contiguous structures. The lateral sinus was certainly more forward in these chronic cases, as pointed out in Dr. Richards' paper. The effect on the hearing was of slight and secondary importance.

Dr. C. R. Holmes reported another case of facial paralysis coming on after ossiculectomy and curetting of the upper and posterior wall. Complete paralysis developed on the seventh day and disappeared in about two weeks. He had never been in favor of the Stacke operation because of the liability of wounding important structures.

A study of a great many temporal bones and taking plenty of time in operating would minimize these dangers. He had frequently exposed the dura and the lateral sinus, and did not think there was any danger in so doing. He preferred to open up and see what he was doing so as to effect a permanent cure. He believed that there should be one hundred per cent. of cures after one or more radical operations, barring intracranial complications. He was satisfied that Dr. Dench's method of using the incus hook was better than that taught him by Schwarze, and he had proved by actual experiment that by the latter method there was danger of dislocating the incus into the antrum. He preferred to do the plain Schwarze-Stacke operation, and the actual time of operation with him varied from twenty minutes to an hour and a half. If one cut freely into the cartilage one was likely to have perichondritis result with consequent shrinkage of the ear. In the majority of cases he left the wound open at first, allowing it to close in the second or third week. In young persons it could sometimes be closed at once. In the vast majority of cases the hearing had been better or not injured. Chronic suppuration even of a low grade was unquestionably deleterious to the general health, as was shown by a slight rise of temperature and a sallow complexion. The mouth of the tube should be most thoroughly, almost severely curetted. According to his experience the after treatment was very important, and it seemed impossible to train the average hospital interne in a short time to dress these wounds properly.

Dr. James F. McCaw, of Watertown, New York, asked what was the experience of the members with ossiculectomy as to the formation of a new tympanic membrane, and what had been the effect on audition. This question was prompted by personal experience. Subsequent to this new membrane formation improvement in hearing had been afforded by the use of the Valsalva method.

Immediately after the operation the hearing had been enormously augmented. The formation of the tympanic membrane had required about two years.

Dr. M. D. Lederman, of New York, said that he thought all would agree that the radical operation would be the future treatment of chronic suppurative otitis media, but the dangers must be taken into consideration. At the last meeting of the society he had reported a case in which there had been a malposition of the lateral sinus. In using the chisel heroically one was apt to make too rapid progress. Where there was mastoid involvement there was danger of sinus thrombosis from the opening of a sinus previously healthy. He knew of three such cases; hence the necessity for the cautious removal of the diseased tissue around the sinus. He recalled a case in which reformation of the drum took place in four weeks, the case being one of long standing suppuration. At that time the patient complained of pain, and, fearing retention of secretion, the membrane was removed and also some granulation tissue found in the attic. This caused severe vertigo and vomiting, which necessitated the patient's remaining in the office for two hours. One of his cases has been compelled to stay in bed for two weeks because of severe vertigo and projectile vomiting. He would again insist upon the great importance of thoroughly curetting the tympanic orifice of the Eustachian tube.

Dr. Robert Levy asked what was the average length of time the discharge lasted after the two flap methods described; also in those instances in which the posterior wound was allowed to remain open for three or four weeks, what was the after treatment of this portion.

Dr. Dench said that the drum membrane sometimes reformed, and it seemed often to make the hearing worse. He did not think the special flap method required had any effect on the time the discharge lasted; he ordinarily expected this time to be from six weeks to two months.

Dr. G. Hudson Makuen, of Philadelphia, reported:

A Nasopharyngeal Tumor,

and exhibited the patient. He was a youth of eighteen having a tumor attached to the posterior third of the left nostril and to the vault of the pharynx. Both nostrils were practically occluded. The tumor filled the vault of the pharynx. A small section of the growth had been examined by Dr. David Riesman, who reported it to be an edematous fibromatous growth characterized by stratified epithelium. On July 7, 1901, under ether, a portion of the growth had been removed with a snare and No. 10 wire.

The tumor was very vascular and the operation was followed by considerable hemorrhage. This specimen was examined by Dr. W. M. L. Coplin and thought to be granulomatous. Nothing had been done since that time, and the patient had become apathetic in regard to it. There had not been much change in the case except the appearance of an infiltration of the muscles of the cheek. Antisyphilitic remedies had been employed without effect.

Dr. H. W. Loeb said that he did not place overmuch reliance on the diagnosis by the microscope of this class of cases. He would suggest that in this particular case electrolysis be used. He had seen marked improvement in three such cases, not only in a reduction of the vascularity but in the size of the growth, and others had reported good results. One of his cases had been kept under observation about ten years. He did not like the infiltration in the cheek, because one of his cases that proved to be malignant had acted in a similar manner; the mass proved to be an extension of the growth around the posterior surface of the superior maxilla. In one case, thought to be a fibrosarcoma with elastic fibres, the tumor grew from the vicinity of the Eustachian tube. The course of the case did not point to its being a sarcoma.

Dr. Ewing W. Day, of Pittsburg, said that he had unfortunately met with a number of such cases. One of them was a very extensive fibroma. The patient would not consent to removal of the superior maxilla, so he had made the incision as for that operation but not going under the eye. He had then cut into the maxillary antrum and cut away the inner wall of the antrum, leaving the nostril attached to the outer border of the bone. When the antrum and the nasal cavity were thus thrown into one cavity he was able to reach the root of the growth, and remove it without producing much hemorrhage. He had been surprised at the wide field of operation thus obtained. This operation had been done three years ago, and there had been no recurrence. If he had to do the operation again he would leave only a ridge to anchor the nose to, and so prevent the ballooning that now takes place in this patient when blowing the nose.

Dr. J. A. Stucky said he believed that if this infiltration of the nose were left untreated it would require an external operation. From his own experience he felt that it was not possible to make a snare that would remove the tumor from Makuen's patient. Mention was made of an exceedingly trying case of the kind that had fallen to his own lot.

Dr. J. O. McReynolds, Dallas, Texas, advised using a cold wire snare, and holding it in position while an assistant tightened the snare as much as possible. Having made a pedicle in this way, the galvano cautery loop should be thrown around the growth. This method would allow some of these growths to be removed that would ordinarily break snare after snare. A case was cited in which the superficial layers of the growth indicated only fibroma, but examination of the deeper ones showed sarcomatous elements.

Dr. M. D. Lederman, of New York, said that he had some experience with Dr. Dawbarn's method of operating in order to starve out these growths in the rhinopharynx, and he would suggest that Dr. Makuen consider this in connection with his case. A case was referred to in which the patient had been seen five years after the Dawbarn operation and there had been at that time no return of the growth.

Dr. Edward B. Dench remarked that Dawbarn's method embraced ligation of the external carotids and their branches, with complete excision of the ligated vessels.

Dr. G. H. Makuen said that it had been impossible to get the cold wire snare around the tumor because it extended so far down on the posterior pharyngeal wall. The patient and his family would probably not consent to any other radical operation.

Dr. Max A. Goldstein, of St. Louis, read a paper:

Tuberculosis of the Middle Ear, with Report of Case.

He expressed conviction that primary tubercular infection of the middle ear was not only possible but more frequent than generally believed. In substantiation of this a case was reported in which careful physical examination showed no tuberculosis elsewhere, yet subsequently an acute miliary tuberculosis developed in the lungs and was proved to exist at autopsy. It was thought to be secondary to the tuberculous process in the ear. Altogether five cases were reported, which were believed to be examples of primary tuberculosis of the middle ear. There was no family history of tuberculosis in these cases.

Dr. Robert Levy, of Denver, said that if we more often resorted to such microscopic examinations the literature of this class of cases would probably be extended. While not questioning the diagnosis at all he would suggest that in some cases in which tubercle bacilli were found there was the possibility of the extraneous presence of the tubercle bacilli.

Dr. E. B. Dench also expressed the opinion that this method of systematic examination if extended would probably show evidence of tuberculosis in very many more cases. This had been the experience in joint tuberculosis. The paper was certainly most instructive and suggestive.

Dr. J. O. McReynolds reported the case of a child six years old who had been brought to him some years ago with chronic disease of the middle ear. He did a radical operation and completely cured the local condition. Two years later the patient developed disease of the spine and hip joint, and died of tubercular meningitis. He looked upon this case as an example of primary tuberculosis of the middle ear. He would like to know if there was any scientific ground for the popular notion that the healing of a tubercular process in one part of the body would result in its breaking out in another part.

Dr. H. W. Loeb said that tuberculin should be used in these cases with a view to determining the presence of tuberculosis elsewhere. He did not think a reaction would be obtained from the process in the ear.

Dr. G. L. Richards asked for the experience of Dr. Levy with regard to the tuberculin test.

Dr. Levy said that in very incipient cases of tuberculosis the tuberculin had often cleared up the diagnosis, but he had never used it in connection with purely local tuberculosis.

Dr. Wm. L. Ballenger, of Chicago, said that he had had no experience with the tuberculin test in local processes, but he had observed its action in incipient tuberculosis. He mentioned two cases in which experts in physical diagnosis had found no pulmonary tuberculosis, and yet the appearance of the larynx suggested tuberculosis, and the application of the tuberculin test produced the characteristic reaction. He saw no reason why tuberculosis should not be primary in the larynx and in the middle ear.

Dr. John A. Thompson, of Cincinnati, said that it was claimed that tuberculosis is always first a disease of the lymphatic glands, either of Waldeyer's ring or of the intestine, and that tuberculosis never occurs in the lungs until the lymphatics at the root of the lungs are first involved. This, he thought, would enable one to make a diagnosis of tuberculosis before there were any physical signs in the lungs. In cases of obstinate catarrhal laryngitis with an evening rise of temperature, even without physical signs, he favored making the diagnosis of incipient tuberculosis and sending the patient to a proper climate. He had known several such cases to subsequently develop pulmonary tuberculosis.

Dr. Goldstein said that the remark made by Dr. Levy simply corroborated his own view with regard to the possibility of local infection.

SECOND DAY, TUESDAY, JUNE 3D.

Dr. Joseph T. Gibb, of Philadelphia, made:

Report of a Case in which Laryngeal Symptoms Complicated Purpura Hemorrhagica.

The patient, a man of forty-two, had been well up to three weeks before admission to hospital on November 3, 1901. At that time he had been vaccinated, and ten days later the legs became swollen and a hemorrhagic rash appeared upon them. About this time there was a bloody discharge from the bowels. There were subsequent crops of hemorrhagic spots, and eventually the urine became bloody. On December 19 the speaker had first seen him because of an attack of dyspnea and crowing respiration that had existed for thirty-six hours. The entire larynx was red; the breath sounds were weak and there was marked laryngeal stenosis. On the following day after vomiting much chocolate colored mucus, the breath became nearly normal; the larynx then showed less infiltration and the surface of the mucous membrane was covered with fluid blood. An application of cocain and adrenalin gave marked but temporary relief, the hemorrhage recurring, and the patient dying next day of exhaustion. Evidently the dyspnea was due to hemorrhagic edema of the submucosa of the larynx similar to the subcutaneous purpuric spots in the simple cases. The relation of the illness to the vaccination was interesting but by no means clear. The possible relation between the adrenalin and the last hemorrhage was also worthy of consideration.

Hemorrhage in Nasal Operations.

Dr. John O. McReynolds, of Dallas, Texas, instead of reading the full paper on this subject, reported one case of severe hemorrhage occurring after the use of adrenalin.

The case was that of a man of twenty-five, from whom he removed without difficulty an exostosis situated rather high in the nose. The hemorrhage occurred almost immediately after the patient leaving the office, but he did not see the man for about two hours, and then he was almost exsanguinated. The hemorrhage was controlled by packing the posterior nares.

Dr. W. Freudenthal, of New York, exhibited a device which he used for controlling hemorrhage during and after operation. It consisted of a double ice bag which is applied like a saddle over the nose, and is strapped around the head. In addition, he obtained valuable assistance from the use of stypticin internally.

Dr. J. A. Thompson thought the hemorrhage was due to the injury of one of the small arteries of the septum. Hemorrhage could be much more easily controlled by the use of cotton saturated with a styptic than by the use of gauze.

Dr. J. A. Stucky said that adrenalin should be used in the strength of one to six or eight thousand. He was accustomed to control nasal hemorrhage by the use of a little strip of dental rubber over which is placed a piece of Bernays' sponge or splint.

Dr. H. Bert Ellis, of Los Angeles, Cal., said that according to his experience hemorrhage was much less likely to occur after adrenalin alone than after the combination of adrenalin and cocain. Patients put on the chlorid of calcium prior to operation were rarely troubled with secondary hemorrhage.

Dr. M. A. Goldstein said that it was his custom to saturate the gauze with oil or melted vaseline in order to make it impervious, and hence, suitable for controlling hemorrhage. He believed the Simpson modification of the compressed cotton splint, shaped in the form of a nasal plug, was a very satisfactory means of controlling nasal hemorrhage.

Dr. Wm. L. Ballenger, of Chicago, presented:

A Physiologic Statement of Some of the Symptoms of Mouth Breathing.*

Dr. Eugene Vansant, of Philadelphia, thought the cases in which respiratory function was abolished were very rare. In a case of severe adenoids in a child asleep there would still be found nasal respiration. If these persons were true mouth breathers there would not be much difficulty; it was because they remained nose breathers that nervous distarbances arose. There was not the slightest doubt that there was immense thickening of the epithelial lining of the pharynx and larynx, but he was disposed to doubt that such thickening extended to the air cells except in severe cases of long standing.

D. J. A. Thompson said that the interchange of gases was practically an osmosis, and it was well known that this would not take place through a dry membrane. Where nasal respiration was abnormal the pulmonary alveoli became unnaturally dry, and this was probably one of the features in the deficient osmosis and oxidation of the blood.

Dr. W. Freudenthal, of New York, said that some years ago he had made a number of experiments on this subject, and had found that children with pronounced adenoids gave off about one-ninth or one-eighth of the normal quantity of moisture. Four months after the removal of the adenoids one boy gave off about the normal amount of moisture from the nose. If the nose failed to supply the moisture to the air this would be supplied for a time by the pharynx, but the latter would soon fail also.

Dr. Ballenger, in closing, said that it was not necessary to have complete nasal construction in order to produce the pathologic conditions discussed in his paper. The point made by Dr. Thompson seemed to him very well taken.

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*See page 470.

Dr. W. Freudenthal, of New York, read a paper:

Electric Light in Diseases of the Respiratory Organs.

At first he had hoped to affect the deeper tissues by the actual passage of bactericidal rays into them, but it was found that these just penetrate the epidermis and cutis. In studying the therapeutic effects of the electric light one must distinguish between the incandescent and the arc light. The author said that he had been experimenting on this line as early as 1889. He had found the arc light preferable even for the larynx. He made use of the ordinary search light, in front of which the patient sits at a distance of six or eight feet. Most of the screens suggested for removing the heat were objectionable because they absorbed in large amount certain other important rays. He used the electric light in the treatment of both laryngeal and pulmonary tuberculosis, and although he had never cured an advanced case by this means the treatment was of value just as was the use of morphin, heroin or hydrotherapy; indeed, the electric light treatment stood on the same level as hydrotherapy, but was superior to the latter because it relieved pain and facilitated expectoration. Because of the neurotic element in cases of hay asthma the results of the electric light treatment had been more conspicuous.

Dr. H. Holbrook Curtis asked the effect of direct sunlight on laryngeal phthisis.

Dr. Robert Levy said that he had never been able to satisfy himself, from the published reports, that the application of sunlight or artificial light was an important adjunct to the treatment. Equally good results, he thought, could be obtained in high altitudes where sunlight was not abundant.

Dr. Freudenthal said that he had applied sunlight and was accustomed to advise his patients to expose themselves to sunlight preferably while undressed.

Dr. Robert C. Myles, of New York, read a general paper introducing:

A Symposium on Diseases of the Accessory Sinuses.*

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*See page 423.

Dr. Eugene L. Vansant, of Philadelphia, presented a paper on:

The Ethmoid Cells.*

Dr. Cornelius G. Coakley, of New York, read a paper:

The Sphenoidal Cells.

He said that the first reference he had found to this affection was in connection with an autopsy record in 1872, and Schaffer, in 1885, had been the first to detect and treat this condition in the living. Influenza or severe rhinitis were most commonly responsible for acute inflammation of these cells. There were usually fever, rigors and headache; sometimes pain referred to the back of the orbit was the only symptom complained of. Examination of the nasopharynx would usually show a thick, tenacious mucus, but it could not be seen from the sinus. The nasal mucous membrane should be kept thoroughly contracted by the frequent use of cocain and adrenalin, and the nose should be irrigated with saline solution having a temperature of about 120 F. If this treatment did not give relief some more radical measure would be demanded. In the chronic cases, examination of the anterior portion of the nose might not show any pus, but pus would usually be found issuing from the posterior nares. By means of a fairly stiff graduated copper probe he endeavored to enter the sphenoidal sinus. At the depth of 7 cm. the end of the probe would ususually reach this sinus, and on entering the sinus it could be pushed one to one and a half centimeters further. A canula is then passed into the cavity and the latter irrigated with warm sterile normal saline solution. If the fluid running out were pus-laden the diagnosis was complete. With a Bryant's gouge and curette the anterior wall below the ostium was broken down. Frequently the removal of a part or all of the middle turbinate was required before catherization and irrigation could be accomplished.

Dr. F. C. Cobb, of Boston, read a paper:

The Antrum of Highmore.

He divided cases of antral disease as follows: (1) Empyema secondary to frontal or ethmoidal disease; (2) empyema due to decayed teeth; (3) empyema due to foreign bodies, such as rubber injected by dentists, or to eruption of teeth in or about the antrum; (4) empyema due to obstruction by new growths or polypi; (5) suppuration resulting from tumors and (6) empyema due to syphilis, and resulting in necrosis generally of some portion of the antral wall. The apparent absence of teeth did not eliminate antral disease arising from diseased roots left behind beneath the gum and often overlooked. Syphilitic empyema was usually diagnosed by the odor and softening of the bone, and its appearance in the discharge. Antral disease was often confounded with dentigerous cysts. The walls of such cysts were bony and offered the same resistance to the probe as do the walls of the antrum. If on tapping and washing out the antrum, a flow of pus occurred within an hour or two, one might be sure that it came from some source outside of the antrum. The operation of Lothrop, throwing open the antrum into the nasal cavity, was probably the best of this class of operations. Better still was the making of a wide opening into the canine fossa, leaving a flap which may be stitched up afterward, and then making an opening so as to secure drainage through the nose. In the latter a wick should be placed.

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*See page 428.

Dr. Lewis A. Coffin, of New York, presented his paper:

The Diagnosis and Treatment of Frontal Sinus Disease.

In well marked cases there would be persistent frontal headache with tenderness over the orbital region, and examination would show the nasal mucous membrane swollen and boggy, and pus probably oozing from the middle meatus. Transillumination would assist in the diagnosis. The chronic cases were not so easily recognized. In many cases an exploratory operation was necessary and justifiable to establish the diagnosis. By the use of a specially devised trephine a bone flap could be readily raised. As primary union occurred after this operation no deformity resulted. Where disease was found drainage should be established by one of several methods. He favored the drawing down of a small rubber tube through the frontonasal duct. The closed method was followed by many relapses. For exploratory purposes the opening should be made as near as possible to the median line. The exploratory openings should be situated just over the inner canthus of the eye, and if necessary, the opening should be enlarged at the expense of the inferior wall. The closed method should be used only in cases in which there is obstruction of the frontal nasal duct which can be easily removed. There was no occasion for establishing drainage through the nose.

Dr. H. Holbrook Curtis, of New York, read an abstract of

The Technique of Frontal Sinus Operations—Report of Three Cases Without Nasal Drainage.

He exhibited a dressing that he had found exceedingly useful in packing these sinuses, i. e., zephyr wool deprived of its fat so as to make it absorbent. Dr. Curtis also exhibited an electric sinus lamp and a cheek retractor which he highly recommended. He particularly dwelt upon the necessity of obliteration of the sinus, and said that the fear of a deforming cicatrix was the bugbear of sinus operations. He considered that an operator should understand plastic surgery, do bold work and rely upon paraffin and his knife to obliterate the depression and the scar.

Dr. John O. Roe, of Rochester, presented a series of skulls to show the wide variations in the sinuses, thus emphasizing the necessity of modifying the method of treatment to suit the individual case. Not only were there marked variations in the location, size and direction, but in the presence of septa, and in their number. In some cases there was almost no frontal sinus, showing the danger of using a drill in opening the sinus which, under such circumstances, would pass through and injure the meninges. He had devised a curved drill run by an electric motor an instrument by means of which it was easy to enlarge the natural channel from the frontal sinus into the nose. The end of the drill was protected on one side by a shield so as to enlarge but one side of the passage and thereby avoid a subsequent closure of the passage.

Dr. James F. McCaw, of Watertown, New York, spoke of the case of a lady who had had all her teeth extracted eighteen years before coming under observation. Because of a chronic discharge and the presence of roughened bone, an incision was made along the alveolar process, and he was surprised on coming down upon a tooth lying in a cavity of the alveolar process and parallel to it. The tooth was removed and the cavity curetted, and since then there has been no trouble.

Dr. Thomas J. Harris, of New York, said that in his hands transillumination had proved of very little value in connection with the frontal sinus. In many cases in which pus had been found at operation there had been no darkening at all on the transillumination, and in other instances when there was darkening little or no pus had been found. He agreed with Dr. Coffin that in each case one must decide whether the open or closed operation should be selected. He firmly believed that in cases in which it was not possible to find marked disease of the ethmoidal cells, the quickest and most satisfactory results would be attained by doing the open operation as described by Dr. Coffin. This operation could be done thoroughly and yet leave practically no deformity.

Dr. Sargent F. Snow, of Syracuse, said that the symposium had deeply interested him. A large majority of these frontal sinus cases would get well with better drainage into the nasal passages, not that he recommended exclusively the internal operation in all cases. Quite recently he had discovered that a number of these chronic cases had an underlying syphilitic taint, and that a thorough course solved the problem. Investigation along this line is replete with surprises.

Dr. Thomas H. Farrell, of Utica, asked for experience regarding the production of distressing symptoms by adrenalin.

Dr. R. C. Myles said that while small frontal sinuses did well under packing, large sinuses would require packing for an indefinite period, and would fill up with granulations very slowly. Some persons could be kept very comfortable by having a permanent opening in the antrum.

Dr. C. G. Coakley said that he had found the periosteum so much diseased in many cases that he doubted if gentle curettage would suffice. Many patients who had suffered for a long time from antrum disease were greatly improved by a change of air. He had tried the x-ray in cases of disease of the accessory sinuses, but in only one instance had he derived any material aid from this source except for the determination of the presence and size of a sinus.

His rule was not to irrigate except at the close of the operation. The packing was changed as infrequently as possible because each change of dressing disturbed the granulating process. By operating near the inner angle of the eye the resulting scar would be almost imperceptible.

Dr. L. A. Coffin said he could not see how Dr. Roe's drill could be made to pass down into the fronto-nasal duct. In one case in which there was pain and a shadow on transillumination, although no symptoms pointing directly to the nose, on opening the sinus an angioma was discovered.

Dr. Frank A. Miller, of New York, read:

A Study of Corditis Cantorum, or Nodes, with Special Reference to Etiology and Treatment,

and illustrated it by lantern slides and by the presentation of several patients, together with a demonstration of the exercises employed in carrying out the treatment.

Dr. James F. McCaw, of Watertown, New York, read a paper, reporting a case of:

Primary Epithelioma of the Uvula and Soft Palate, and the Treatment with the Roentgen Ray.

A screen of block tin with a cylinder of the same material served to direct the x-ray upon the desired part. The diseased surface had healed very satisfactorily under the treatment, the chief feature of the healing process being the comparative freedom from cicatricial tissue, and slight degree of contraction.

Dr. C. G. Coakley said that he had used the x-ray in a case of epithelioma of the superior maxilla, supposed to be of about three week's duration. The man refused surgical operation, and was treated by the x-ray for a week by Dr. William James Morton with some improvement. The patient then went away for a short time on business, and on his return the disease was found to have advanced very considerably.

Dr. Otto J. Stein, of Chicago, referred to a case of leukoplakia of the soft palate and mouth that he had treated for about three months by the usual method without benefit. Last December the x-ray treatment of the case had been begun by Dr. Pusey, and after two months he had reported the case as a failure. After another period of two months the result was still negative. In Dr. McCaw's case it seemed difficult to determine how much of the good result was due to the surgical measures and how much to the x-ray.

Dr. McCaw said he believed most of the good results that would be obtained from the x-ray in this class of cases would be after incision of the growth. The result would also vary somewhat, depending upon whether a "hard" or a "soft" x-ray tube were used.

Dr. C. Dunbar Roy, of Atlanta, Ga. presented a:

Report of a Case of Laryngeal Papilloma in a Child, with Remarks.*

Dr. Wendell C. Phillips, of New York, insisted upon the great care necessary in making the diagnosis of what seemed to be benign neoplasms of the larynx because many of these proved to be malignant. In one such case occurring in his own practice, the growth proved to be an epithelioma in a very late stage. Almost any one observing this growth would have declared it to be a papilloma, yet microscopic examination showed its true nature.

Dr. Thomas J. Harris said he wished to emphasize the value, in prolonged papillomatous formations, of opening the trachea. A case was recalled in which the growths had been removed repeatedly by Dr. Nichols endolaryngeally, and in which alcohol had also been used unsuccessfully. Prolonged tracheotomy was then resorted to in order to give the part a prolonged rest. This succeeded admirably.

Dr. C. G. Coakley spoke of the similarity in structure of so-called papillomata and syphilitic growths. He was in favor of removing the papillomata in both children and adults as soon as possible. Where the base was broad they were, of course, difficult of removal. It was his habit afterward to make use of alcohol in order to postpone recurrence. Where the attachment was small one removal would often suffice.

Dr. W. B. Shields referred to the case of a physician of seventy years upon whom he had operated twice, supposing the growth to be a papilloma from its gross appearance. Microscopic examination showed it to be a sarcoma.

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*See page 482.

Dr. Roy, in closing, said that he was opposed to the method of Coakley and Phillips of removing a portion of the growth for examination, because this afforded an excellent opportunity for auto-intoxication and for the change of a benign into a malignant neoplasm. He was not in favor of removing a growth in the larynx as soon as found; it was better, in his opinion, to watch it carefully and test the effect of various medical applications.

Dr. D. J. Gibb Wishart, of Toronto, Ont., read a paper:

Abductor Paralysis of the Larynx,

reporting a case of primary adductor paralysis occurring in a person apparently suffering from tabes dorsalis and giving a history of syphilis. The cricoarytenoid articulation in this case did not seem to be responsible for the position of the cords. The patient was tracheotomized and the tube had been worn for several years with great benefit.

Resection of the recurrent laryngeal nerve was justifiable if the disease was steadily progressive. Both iodid and arsenic had been given internally. Dr. Wishart said that he had seen a second case last winter with a history of esophageal stricture in the practice of Dr. H. D. Bruce. The patient refused operation and remained under observation only a few days.

Dr. W. Haskin, of New York, made:

Report of a Case of Epithelioma of the Tympanic Cavity Involving the Mastoid.*

THIRD DAY, WEDNESDAY, JUNE 4TH.

Dr. Edward B. Dench, of New York, exhibited:

Drawings of the Venous System of the Neck.

showing the anatomic relations in a subject recently dissected, of the right and left internal jugular veins. Upon the right side the internal jugular was of small size and gave off but one branch, the common lingual and facial trunk throughout its entire extent. Almost the entire return circulation from the head and face was carried on through the left side. The external jugular and anterior jugular were very large as were also the lingual and facial veins. The thyroid and laryngeal branches were in like manner exceedingly well developed. Almost all of the return current from the head and face passed through the superficial and deep vessels of the left side. The drawings were of interest from the fact that the otologist is frequently called upon to excise the internal jugular vein for thrombosis of the lateral sinus. With a distribution of the vessels such as was shown in the plates exhibited, ligation upon the left side would have been attended with considerable difficulty, and would only have been efficacious had all of the collateral branches of the vein been secured. The plate was presented in order to bring to the attention of the society the very marked anomalies which might exist in the venous circulation in this region.

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*See page 491.

Dr. Thomas H. Farrell, of Utica, presented a

Specimen of Tubercular Larynx

obtained post-mortem from a case that he had observed at intervals of five years. The ulceration was found to encircle the larynx with the exception of a small strip on the anterior surface of the body of the cricoid. The specimen was interesting because in spite of the long period of infection the posterior commissure was not involved, and the appearance bore considerable resemblance to syphilis.

Outfit for Mastoid Cases.

Dr. Wendell C. Phillips, of New York, said that about two months ago, at the suggestion of Dr. J. F. McKernon, of New York, an outfit had been prepared by Van Horn & Co., of New York, for use in mastoid cases. This as modified by himself, was exhibited to the Society. One complete outfit was kept in stock, and could be procured on telephone order or on prescription. The outfit consisted of all necessary appliances, dressings and medicines necessary for any mastoid operation.

Dr. Phillips also presented a paper:

Pus Examination in Middle Ear Suppuration.

He said that modern practice favored the routine bacteriologic examination of all cases of suppuration of the middle ear, this examination to be made immediately after paracentesis, so as to eliminate organisms subsequently introduced from without. The micro-organisms found their way into the middle ear through the inflamed Eustachian tube. Some of the most virulent of these organisms were frequently found in the Eustachian tube, and even as far as the antrum without any attendant morbid process. It had been demonstrated that they might even be found in the circulation without giving rise to pyemia or septicemia. From these facts it was evident that other factors, such as alterations in the resisting power of the patient and in the nature of the pabulum on which they live must be necessary to excite a morbid process. Several varieties were apt to be found in the same specimen, and hence it was the rule for the bacteriologist to state which organism predominated. Some of the organisms found in the pus from middle ear disease are: the micrococcus lanceolatus, the pneumo-bacillus of Friedlander, the streptococcus pyogenes, the staphylococcus pyogenes aureus, albus and citreus, the Klebs-Loeffler bacillus, the tubercle bacillus, the gonococcus, the bacillus of influenza and the diplococcus intracellularis meningitidis. In the examinations he had made he had been surprised at the frequency with which the last named bacillus had been present. In one of his cases the smegma bacillus had been mistaken by the first examiner for the tubercle bacillus. Many clinicians had reported that in the cases in which the pneumococcus was present complications were very apt to arise, and while this was true, his experience indicated that the staphylococcus, either alone or in combination, was the most virulent.

Dr. W. H. Haskin, of New York, said that in a case which he had had under observance he had found time and again the smegma bacillus, and had been impressed with its close resemblance to the bacillus of tuberculosis. However, it was rarely if ever found singly. The tubercle bacillus was very rarely found in middle ear disease, and he believed in many of the reported cases this error had been made of confounding the smegma bacillus and the bacillus of tuberbulosis.

Dr. E. B. Dench said that an early bacteriologic examination in an acute case proved very helpful in making a prognosis, particularly as regards mastoid complicatious and infection of the lateral sinus. They had found at the New York Eye and Ear Infirmary that in cases of streptococcus infection there was very apt to be mastoid involvement. In these cases it was now their practice to make no effort to abort the mastoid inflammation except by incision of the drum. If the case did not promptly show signs of improvement the mastoid was at once opened.

Mention was made of a case in which the symptoms had developed in a few hours, and the examination showed a streptococcus inflammation. Only one ear was affected at first, and the other drum membrane perfectly normal, yet within two hours the membrane of the second ear became inflamed, and streptococci were found on this side also.

Dr. M. D. Lederman said that he had had examinations made in several cases of chronic suppuration, and the bacillus of meningitis had been found. The pathologist did not attach any special significance. Where there were symptoms pointing to inflammation of the bony structure in these cases it was well to operate early.

Dr. John M. Ingersoll asked what was the effect of the colon bacillus in these cases?

Dr. C. R. Holmes, of Cincinnati, said that the importance of such examinations could not be denied, yet unless such examinations were made by experts the results would be misleading. They should be made a matter of routine.

Dr. Phillips, in closing the discussion, said that if doubtful about the advisability of doing a mastoid operation, the finding of numerous streptococci should decide in favor of immediate operation. He had had almost no personal experience with colon bacillus infection in these cases.

Case Showing Deformity After Double Mastoid Operation.

Dr. C. R. Holmes, of Cincinnati, presented a lady to show the deformity left after a very extensive double mastoid operation done five years ago.

Dr. Ewing W. Day, of Pittsburg, read a paper reporting:

Two Cases of Mastoiditis, One Resulting in Thrombosis of the Cavernous Sinus, the Other Complicated with Tumor of the Cerebellum Simulating Abscess.*

Dr. W. C. Phillips said that he had followed the case reported by Dr. Berens, and remembered that at the time of the operation not one of the otologic staff of the hospital was convinced that it was an operative case. The operation was done at the request of the neurologists, and in the manner indicated by them.

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*See page 520.

Dr. Berens said that the subsequent history showed the operation to have been justifiable because the boy was entirely relieved of his pain and greatly relieved of vomiting, probably by the drainage of the cerebrospinal fluid, and his life was prolonged, probably at least two months, by the operation.

Dr. Henry J. Hartz, of Detroit, presented his paper:

The Pathology and Diagnosis of Otitis Media Insidiosa (Sclerosis).

He said that the hyperplasia began with the bone, and involved especially the articulation of the stapes and oval window. This process constitutes not only a hyperplasia, but also a hyperostosis and metaplasia, and might localize itself in any of the structures of the labyrinth and in the chain of the ossicles. When confined to the labyrinth the integrity of the acoustic nerve might be affected in a purely mechanical way, and induce Meniere's complex of symptoms. In this sclerotic process the cartilage disappeared, becoming converted into osseous tissue, and when the tip of the cochlea was involved the patency of the Eustachian tube was threatened. In most cases the membrane of the middle ear had been found thickened as a result of hyperemia, but there were few signs that the disease was the result of middle ear suppuration. Rheumatism, gout, syphilis, and scrofula, and diseases of the nasopharynx, such as adenoids and enlarged turbinates, were looked upon as predisposing causes. The duration of the process had been known to vary from three to thirty years. The diagnosis made by the exclusion of all other forms of progressive deafness and by the functional test. Statistics showed that about 10 per cent. of all middle ear diseases were examples of true sclerosis or the result of spongiose formations. There was usually a high degree of deafness in both ears, and the process began usually between the age of twenty and thirty years. Women were more often affected, and seventeen per cent. arose during the puerperium. The deafness of old age must be excluded. Most important of all was the exclusion of catarrhal and suppurative diseases of the middle ear and tube. By the determination of the lower tone limit one could say whether the sclerosis was in the sound-conducting apparatus. Dr. Hartz exhibited Professor Bezold's continuous-tone tuning forks and demonstrated the mode of using them, also microscopic sections of the labyrinth and middle ear showing spongiose formation in the cochlea and ossicles. Some of the specimens were made by Siebenmann and Katz and Bezold.

Dr. William L. Ballenger said that this paper was the clearest exposition of the subject that he had heard. The cases had been divided into two broad classes, one involving the oval window, and the other in which the disease was chiefly confined to the labyrinth. To this might be added a third class, made up of a mixture of these two. A positive diagnosis was usually made only by microscopic and post-mortem study. The disease was not always slowly progressive, but sometimes proceeded by leaps and bounds. This was probably to be explained by the involvement of the region of the greatest functional activity, i. e., the region of the oval window. If the more remote parts of the bone were involved, then the deafness would be more insidious. He believed with Dr. Hartz that the functional tests of the ear were as important to the otologist as the ophthalmoscope to the ophthalmologist, and he was, therefore, pleased that this set of instruments had been exhibited.

Dr. C. R. Holmes said that the subject was comparatively new, and not very easy to master, although certainly a very important one as stated by the last speaker. The tests were time-consuming, but it would well repay the patient to liberally remunerate the specialist who would carefully make the differential diagnosis, and so save months of inappropriate and ineffective treatment.

Dr. Thomas J. Harris, of New York, read a paper on:

Prognosis in Chronic Catarrh of the Throat and Ear. Some Remarks by a Would-not-be Pessimist.*

Dr. Wendell C. Phillips said that he believed the author of this paper had made these pessimistic statements only to arouse opposition and excite discussion. We were all conscious of failures in certain cases. He did not think it was possible, for example, to convince any member of this society that it was desirable to abandon the use of the Eustachian catheter, even though aurists of high reputation, having lost interest in their work, have stated their belief that this instrument was almost useless. He was very glad to have the opportunity to champion the use of the catheter when intelligently applied.

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*See page 437.

Dr. C. R. Holmes said he believed in the use of the aural catheter. It was well not to promise too much in these cases. All that he would say to his patients was that he hoped to secure them as good hearing as they possessed when in their best physical condition. He was decidedly opposed to the removal of nasal spurs unless they were distinctly responsible for some pathologic condition. In some cases a turbinectomy would make the subsequent use of the aural catheter unnecessary. Much depended upon habits of life.

Dr. T. Passmore Berens said that the practice of removing turbinates wholesale was no longer popular, and more dependence was placed upon hygienic treatment.

Dr. J. A. Stucky said that at the present time he used the catheter once when formerly he used it perhaps fifty times, and he did not interfere with the spurs unless they were actually doing harm. He did, however, remove pathologic conditions of the turbinate.

Dr. Max Goldstein said that if the author of the paper had confined his criticisms to the sclerotic form most of those present would probably agree with him. One should sharply distinguish between the sclerotic and the hypertrophic form.

Dr. W. L. Ballenger said that he understood that all the author of the paper desired was that each case should be thoroughly studied and "fashions" in treatment avoided. We should not set our faces against the removal of nasal spurs because at times these operations do much good.

Dr. G. L. Richards mentioned a case in which after the removal of an obstructing nasal spur the hearing improved very much without direct treatment of the ears.

Dr. Walter A. Wells, of Washington, D. C., reported a:

Case of Thyroid Gland Tumor in the Larynx.*

Dr. M. A. Goldstein asked how the gelatin had been used in this case.

Dr. Wells replied that a 10 per cent. sterilized solution of gelatin to which had been added 1 per cent. of calcium chlorid and half of 1 per cent. of sodium chlorid was employed. It was employed on a cotton swab before and throughout the operation.

Dr. Thomas H. Halsted, of Syracuse, read a paper,

Foreign Bodies in the Larynx and Lower Respiratory Tract in Children with Report of Six Cases,

reporting six tracheotomies in children under two years and a half old for the removal of foreign bodies lodged in larynx and bronchus. Of the six cases five recovered and one died. At the time of operation dyspnea was urgent in all. In the cases reported the first spasm partially subsided after a few moments and often misled both parents and physician to believe that the foreign body had been ejected. The dyspnea recurred after a short interval and became constant with exacerbations at times. Cyanosis and epigastric recession were present in all cases and because of the nature of the foreign bodies in his cases in only one would the x-ray have been of service. In his first case a piece of shell of a pecan nut was firmly lodged in the ventricle of the larynx. In the second case it was a coffee bean which remained in the right bronchus for one week. In the third case a peanut was extracted with much difficulty from the right bronchus where it was wedged at a distance of four inches from the tracheal opening. The fourth case was somewhat similar to the third one excepting that it was coughed up to the tracheal opening after the trachea had been opened and the trachea tickled with a cotton covered probe to excite cough. The fifth case terminated fatally, death being due to pneumonia and the foreign body not found or removed, and although no autopsy could be obtained there was every reason to believe that the case was one in which a gold ring had lodged in the bronchus. No x-ray apparatus was at hand at that time. The last case reported was that of a twelve months old baby, in whom three fragments of egg shell had lodged in the larynx, remaining there for two weeks, causing great dyspnea. The consent to perform tracheotomy could not be obtained for two or three days after the diagnosis was made and then the child was in bad condition, but nevertheless the operation was successful and the child recovered. The unreliability of statistics regarding operative and let-alone treatment was well shown by the fact that the author knew of a case in which a child died of pneumonia, and the discovery of a shoe button in one of the bronchi was the first knowledge that the parents or physician had that a foreign body had passed into the air passages. It was unsafe, the author thought, to postpone opening the trachea, particularly in children, after the ordinary methods failed to remove the foreign body.

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*See page 455.

Dr. G. Hudson Makuen said that Dr. J. A. Killian had reported the removal of a fish bone 22 mm. long from the left bronchus of a child three and a half years old, under control of the eye by means of bronchoscopy without injury to the tissues, and that Dr. A. Coolidge, Jr., of Boston, had spoken of the ease with which foreign bodies may be removed from the trachea and bronchi through a straight tube placed in a previously made tracheal opening, artificial light being reflected into the tube from a head mirror, and had reported three cases in which he had employed this method with entire success.

Dr. George Fetterolf, of Philadelphia, read a paper:

A Simple Method of Correcting Deflections of the Nasal Septum.

The author emphasized the importance of recognizing the fact that redundant tissue is always present and classified the different forms thus: (1)) Deviation without thickening; (2) deviation with thickening and (3) thickening without deviation. The most difficult to correct were those embraced in the first two classes. The main difficulty that he had experienced has been in the removal of the excess of tissue. The operation should be so planned if possible, as not to disturb the muco-perichondrium. He employs general anesthesia and also applies adrenalin solution to the septum. He makes use of a specially devised saw-file, and makes one, two or three grooves to the perichondrium on the opposite side. The antero-posterior excess can be removed along with the vertical by having the grooves cross each other. The instrument is made in three sizes so as to adapt it to the removal of varying degrees of redundancy, and with it a V-shaped cut can be readily made. A truncated form is used when the grooves already made with the sharp instrument need be widened. The tube is ordinarily not removed for five days after the operation. By the method described, preliminary section of the mucous membrane is unnecessary and the operation can be completed in three or four minutes. The two margins of the V-shaped cut are exactly parallel and thus accurate apposition and quick healing are promoted.

Dr. J. A. Stucky said that he had been deeply interested in this paper because at the meeting of the Southern Section considerable criticism had been directed against the working qualities of Dr. Kyle's saw.

Dr. William R. Lincoln, of Cleveland, said he understood this new instrument had been devised to perfect the technique of Dr. Kyle's operation. The instrument of Asch and others were generally thought to be excellent for cases not urgently requiring operation.

Dr. M. A. Goldstein said that the mechanical features of this instrument seemed to him to constitute a distinct advance beyond former methods. The instrument takes up very little room in the nasal cavity, and its cutting edges operate on both the in and out strokes of the saw. He thought that with this instrument the operation could be made submucous more easily than with any other instrument.

Dr. D. Braden Kyle said that he had employed this V-shaped operation for the correction of deformities of the nasal septum for six years. When describing this operation about three years ago he had only made a limited use of it, but in the last three years this had been the only operation that he had done. At that time he made use of a saw which, if properly made, worked satisfactorily. In cutting out the V-shaped piece two things were accomplished, viz.: (1) the cutting reduced the redundant tissue, and (2) the septum was broken up. The V-shaped file does away with one instrument and shortens the operation materially. There was no bulging of the septum after the operation and no redundant tissue if a sufficiently large V-shaped cut were made. With the V-shaped operation, and particularly with the saw file, perforation of the septum was practically wholly guarded against. The septum must be made to swing freely from the top. Before taking out a number of V-shaped pieces it was well to dissect up a flap of mucous membrane, which is afterward allowed to fall back again. He had never seen any bad effect from even the prolonged use of his metal tube-splint. The tube should be flattened next to the septum.

Dr. Fetterolf, in answer to a question from Dr. T. H. Farrell as to why the general anesthesia was employed in this operation, said that the object was to secure complete relaxation of the patient and avoid possible fainting.

Dr. Harmon Smith, of New York, by special invitation, demonstrated his method of making

Paraffin Injections

for the correction of nasal deformities.

Dr. C. E. Munger, of Waterbury, Conn., said that he had seen some of these cases, and he thought the best result was one in which there had been both a lateral and an antero-posterior deformity. He had had only one case, and in that one twenty-five minims of the paraffin had been injected, and apparently with good result.

EASTERN SECTION OF THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, MEETING AT NEW YORK, MARCH 1, 1902.

Dr. C. E. Munger read a paper:

Nasopharyngeal Adenoids.*

Dr. A. E. Abrams asked if there was any difficulty in the removal.

Dr. Munger replied that there had been no difficulty whatever.

Dr. H. Holbrook Curtis remarked that he thought the subject of hemorrhage in adenoid operations was a very interesting one, for, when it did occur, it was likely to be very profuse. He would like to hear the experience of others on this topic.

Dr. C. G. Coakley, of New York, said that he had had one experience with hemorrhage after the removal of adenoids, and this one had terminated nearly fatally. The patient was a child of a physician, and the operation was done about the time of the introduction of suprarenal extract. He used this before operation. The operation was done with the aid of gas followed by ether, and the hemorrhage was only very slightly less than usual. One hour after the operation he was told that the child had vomited considerable blood, and a few minutes later a second message announced a second vomiting of blood. In about ten minutes more six or seven ounces more of blood were vomited. The child was found to be very anemic and with a pulse of 150 or more. He applied a thick paste of tannic acid, but at the time the hemorrhage had practically stopped. There was no further hemorrhage, but the quantity lost was greater than he had ever observed before or since that time. This experience had led him to prepare himself for hemorrhage as a complication of all these operations by having at hand apparatus for transfusion as well as other means for combatting undue loss of blood.

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*See page 207, May number.

Dr. B. S. Booth, of Troy, N. Y., said that he had had two cases of hemorrhage following the removal of adenoids, both in adults. The hemorrhage occurred in each instance several hours after operation. Apparently the hemorrhage had ceased after the removal of the growth, and the patients had been accordingly sent home. In the course of two or three hours the hemorrhage had recurred, and had been quite brisk, so that he had been summoned. He used injections of very strong solutions of tannic acid and antipyrin, but finally he was obliged to tampon the posterior nares by means of a soft catheter introduced through the anterior nares, and provided with a loop of thread. This plugging controlled the hemorrhage, but the bleeding had lasted all night before the plugging of the nares. He had never met with profuse hemorrhage in children.

Dr. George L. Richards, of Fall River, Mass., said that so far he had fortunately not had any severe cases of hemorrhage after the removal of adenoids.

Dr. N. L. Wilson, of Elizabeth, N. J., said that he had had no experience with severe hemorrhage after this operation, but if he should meet with it he would make pressure with a cotton tampon saturated with a solution of adrenalin. He was satisfied that for half an hour or more this would control the bleeding and give an opportunity to think what else might be done.

Dr. G. L. Richards said that he was in the habit of carrying with him a bottle of full-strength solution of peroxid of hydrogen, also a tampon and a curved forceps, so that, if necessary, he could very quickly saturate the tampon with the peroxid of hydrogen.

Dr. A. E. Abrams asked whether the curette or the forceps had been used by Dr. Booth. In his opinion, there was much more danger from cutting forceps.

Dr. B. S. Booth said that in both cases he had used a dull curette. He was of the opinion that most severe cases of hemorrhage occurring under these circumstances were due to a loss of equilibrium in the vasomotor system.

Dr. George T. Ross, of Montreal, said that one of the speakers had spoken about the use of suprarenal extract. He would like to know if it was not probable that the reaction from the use of this extract might have been responsible for the hemorrhage. Good results certainly followed the use of adrenalin, but it should be borne in mind that when the first effect had passed off there was a possibility of secondary hemorrhage. As to plugging the nasopharyngeal vault, he had felt that when the hemorrhage was exceedingly profuse there was great comfort in plugging with a solution of corrosive sublimate, 1 to 5,000 or 6,000 and tannic acid. It was true that these substances were considered to be chemically incompatible. yet it seemed to him that this combination gave both the antiseptic and the astringent effect desired. He did not think in this use of the combination there was time for any injurious action from the absorption of the resulting chemical product. He had removed the plug in these cases after about six hours. and had observed no bad result. He would like to know whether any one present had had the misfortune to cut an abnormal arterial distribution.

Dr. C. G. Coakley said that he had used suprarenal powder two or three times previous to the experience already related, but it did not seem to him to do very much good, and he had in mind the possibility of secondary hemorrhage after its use. For this reason he had abandoned the use of suprarenal extract. Subsequent inquiry in the case reported showed that there was a distinct tendency in the members of this family to bleed excessively from slight wounds, and yet the case could hardly be called one of hemophilia. At the New York Eye and Ear Infirmary some of the surgeons were now using pure alcohol to swab out the nasopharynx, but he did not make use of it himself for fear of exciting inflammation about the Eustachian tubes.

Dr. H. Holbrook Curtis said that for stopping hemorrhage, either from the lungs or from other parts of the body, where there was a general oozing dependent upon arterial tension, there was nothing so good as strapping the extremities. This would reduce the arterial tension about one-half. Why this procedure was not more generally known and employed was a mystery to him. He had made use of shawl straps applied to the extremities, and had in this way promptly checked most violent pulmonary hemorrhages. As soon as one limb became cyanosed, the blood from that limb should be allowed to go back gradually into the circulation, and then the limb should be strapped up again.

Dr. G. L. Richards read a paper:

Post-Nasal Polypi,

and reported a

A Safety-Pin Case.

Dr. Carl E. Munger, of Waterbury, Conn., said that he had had a little experience recently with a safety-pin case. He exhibited a safety-pin which had been in a child's trachea for four weeks. Several general practitioners had endeavored unsuccessfully to remove it by tracheotomy. When he was called in, the child had bronchopneumonia, and was in bad condition, so any operation for the removal of the pin was deferred. Just as the child was recovering from the pneumonia it developed scarlet fever. When convalescent from the latter disease he had made an examination and had found the tip of the pin projecting through the vocal cords. Several unsuccessful attempts were made with forceps to remove it, but it was finally extracted through the old tracheotomy wound.

Dr. C. W. Richardson, of Washington, D. C., said that seven or eight years ago he had had a similar case in which the pin occluded the right bronchus, and thus gave rise to fairly clear symptoms. He removed the foreign body and reported the case.

Dr. George T. Ross, of Montreal, asked Dr. Richards regarding the manipulation employed. He stated that he thought he had dislodged the pin. Was the manipulation carried out under narcosis?

Dr. Richards replied that he had done it under chloroform anesthesia.

Dr. Ross, continuing, said that in one case he had had difficulty in making the diagnosis in a case of stenosis of the larynx in a child of three years, but had not been allowed to give an anesthetic. It was only with the greatest difficulty that he had succeeded in securing a glimpse of that child's larynx.

Dr. C. G. Coakley said that he felt whenever he had a case in an adult or a child with multiple polypi, and where these recurred after operation, that there was almost certainly diseased bone present. For this reason he was inclined to think that Dr. Richards' opinion that the ethmoidal cells, and probably the sphenoidal sinus, were also involved, was correct. These cells should be broken down and better drainage thus secured. A day or two after removing the polypi he would be in favor of anesthetizing the patient again and making a thorough exploration with a view to determining what cavities are involved, and then securing free drainage without waiting for further symptoms.

Dr. T. Passmore Berens said that in a case of this kind one should be on the lookout for sarcoma. He had seen several such cases, and one of the polypi just presented was certainly suspicious in appearanee.

Dr. Richards said that his experience with the safety-pin case seemed to show that if there was a metallic foreign body in the trachea, and one could secure a satisfactory x-ray picture of it, one could be sure of the situation of the foreign body. If he had another case of this kind he would operate immediately with full confidence in the results of the x-ray diagnosis.

Dr. H. H. Curtis said that he had had a case in which a kernel of corn had been sucked into the right bronchus of a child, and had been expelled six months afterward almost perfectly preserved. Shortly after the foreign body entered a pneumonia developed, but the child recovered and eventually expelled the kernel of corn during a fit of coughing coming on while he was playing with his head hanging downward.

Dr. R. C. Myles reported:

Four Cases of Polypi.*

Dr. George T. Ross asked if transillumination had been found of any utility in arriving at a diagnosis of growths in this region. This question had been frequently discussed, but many seemed to think transillumination was not of much practical value.

Dr. R. C. Myles said that he had examined all these cases thoroughly with the regulated transillumination, that is with a light of definite brilliancy. Transillumination was of no value unless a measured degree of light was employed. He used a four-candle power lamp to the

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*See page 546.

Edison current with a bank of lamps of 66 candle power introduced for resistance.

Dr. B. S. Booth asked if Dr. Myles anticipated recurrence in these cases,

Dr. Myles said that one of these cases had been kept under observation for some time, and there had been no recurrence; another had had one slight recurrence; the other two were in Europe and had not been heard from.

Dr. H. L. Myers, of Norfolk, Va., said that he had had a case very much like the cystic case reported. It was not visible at all by anterior rhinoscopy, and posteriorly only a small portion could be seen. He took the case to be one of polypus underneath the inferior turbinate. He grasped it with the forceps and pulled it forward. It yielded readily, and finally burst, and then to his surprise a wine colored fluid was discharged. It proved to be a pure cyst, and evidently came from the antrum, because a considerable quantity of this fluid was discharged from the antrum when the patient held the head down. This had occurred about three months ago, and there had been so far no evidence of recurrence. The patient complained of severe pain underneath the left eye, but there was little or no difficulty of breathing.

Dr. Myles said that in all of his cases the pedicle was very small. He had unfortunately lost the specimen of the first case.

Dr. H. L. Myers reported:

A Case for Diagnosis.*

Dr. Arthur G. Root, of Albany, said that he had examined this case hastily, and was inclined to believe that it was probably a lymphadenoma. The result of the microscopic examination also seemed to bear out this view. If this diagnosis were correct, he would be disposed to give iodid of potassium and Fowler's solution internally, and then destroy the tissues as rapidly as possible with the cautery. He had seen similar cases involving the whole of the tongue, and had found the cautery better than anything else in the way of local treatment.

Dr. C. G. Coakley said that he understood two microscopic examinations had been made of the growth, and that they had not thrown much light on the diagnosis They showed round cell infiltration, which would favor the view that it was a lymphadenoma. He was of the opinion that these growths were apt to develop into a malignant growth. He thought we should not be satisfied with such negative microscopic examinations. He felt sure that further microscopic examination of this growth would show lymphadenoma or possibly even lupus.

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*See page 290, May number.

Dr. F. C. Cobb said that the microscopic examination was certainly not very satisfactory. The small round cell infiltration occurred either in connection with specific disease or with small round cell sarcoma. In at least one case it had been his lot to observe such a condition of the septum. The latter was infiltrated and the nose was blocked pretty thoroughly. A piece was subjected to microscopic examination, and the report received indicated that it was a sarcoma of the septum. While waiting for operation an ulcer appeared on the soft palate, and the diagnosis was changed to specific disease. She was rapidly cured by large doses of iodid. If the case under discussion were sarcoma it would probably have bled very profusely when touched. If this patient had not received very large doses of the iodid it should receive such treatment. He was disposed to think the case was specific.

Dr. Wendell C. Phillips thought from the history of the case that both specific disease and tuberculosis could be excluded; hence the diagnosis probably lay between lymphadenoma and lupus. His own inclination was in favor of its being lymphadenoma. He was very much obliged to Dr. Myers for bringing this interesting case such a long distance, and thought this practice should be encouraged at the meetings.

Dr. G. L. Richards said that if he had seen this case for the first time in his office he would have made a diagnosis of syphilis, but Dr. Myers thought that disease had been excluded by the treatment already employed.

Dr. Myers replied that he had given this patient only about thirty grains of iodid daily. He was treating her on the theory that the case was specific, but he had only increased the dose up to the point named so far. The medication already given had produced so little benefit that he had become discouraged. She had also received mercury internally.

Dr. F. C. Cobb reported a case of

Peritonsillar Abscess.

Dr. George L. Richards said that he had considerable experience with peritonsillar abscess. Two recent cases had both been in the supratonsillar fossa. One of these patients was a lady physician, who complained of pain in the throat. Examination showed very little, but five days later she stated that she had been unable to swallow for two days. Examination still showed very little; therefore, under cocain he had passed a knife quite deeply into the supratonsillar fossa quite high up. Nothing was found until the knife was passed still further and entered a triangular space, when pus escaped and the patient was relieved. The important and interesting feature was that the visible swelling in the throat was very small. On the evening of the second day he had seen a young lady, who had been vaccinated some days before. As the scab began to separate and become purulent, she developed an attack of tonsillitis. The attack was very slight, and she went to work in a few days. She then became ill, and complained of soreness in the right tonsil. Examination showed nothing, but a few days later the uvula was so edematous that it filled the throat and the girl could neither swallow nor speak. He punctured it in eight places and gave relief. Two days later he passed in a knife, as in the first case, and found pus in this same triangular space. The question of the removal of the tonsil and its relation to recurrence of tonsillitis was very interesting. He thought if the tonsil was to be removed at all it should be separated from adhesions to the faucial pillars and removed thoroughly. His own practice was to remove the tonsils as thoroughly as possible, and he met with comparatively few recurrences, although occasionally he saw cases in which after thorough removal of the tonsil there was recurrent quinsy. He thought that in these cases the pus formed not in the tonsil but in the supratonsillar fossa. If these cases were excised early there would be blood discharged, but the patient would not be greatly relieved.

Dr. R. C. Myles observed that the phagocytes and the bacterial infections refuse to follow the rules laid down in the books. He had understood Dr. Cobb to say that the pus formed internal to the superior constrictor. His own observation had been that the pus was nearly always situated internally just behind the tonsil. It extended as far as the phagocytes would allow it to go. Nature's rule was to throw a larger body of phagocytes in that direction in which the danger from extension would be the greatest. The necrosis usually occurred in the direction of least resistance. These abscesses would usually extend behind the posterior wall of the tonsil anteriorily or beneath the posterior inferior border. Sometimes necrosis would occur at the base of the tonsils and would break through there. The speaker asked why the patient should have quinsy on both sides. It was easy to understand why it should occur on one side, but to have a peritonsillar abscess on one side and have it followed by a peritonsillar abscess on the other side indicated some peculiar structure in the individual case. Probably there was some pathologic condition at the base of the tonsil. He was becoming more and more convinced that from 50 to 75 per cent. could be relieved by early incision. An analysis of 50 or 100 cases would show that the patients operated upon early had the minimum amount of suffering and recovered more rapidly than when incision was delayed. The most common error was not to cut far enough outward. The abscess lies behind the tonsil, and in going through the base of the tonsil the fibrous tissue naturally closes up. If this base were avoided this would not occur. In the recurrent cases the cold abscess was one of the chief causes of recurrence.

Dr. Thomas J. Harris, of New York, said that Dr. Cobb had gone into this subject with unusual thoroughness, and he felt deeply indebted to him for this research. However, Dr. Cobb's therapeutics seemed to be somewhat at variance with that of many others. It was strange to hear the statement that the early incision had not been found beneficial. His own experience was that without exception the patient has been relieved by early incision. He would like to know whether Dr. Cobb had found no ill effects from the radical removal of the tonsil during the attack. He must confess that he had never had the courage to do such radical work during the height of the attack, He would like also to know if Dr. Cobb had abandoned the classic incision at the outside of the tonsil, and now passed into the supratonsillar space, and if so, what was the advantage of this change. It was the experience, he thought, of most practitioners, that if the incision were made at the proper time, pus would be found and relief afforded by the use of the classic incision.

Dr. Carl E. Munger, of Waterbury, Conn., said that he would like to have more information on the situation of the pus. He had seen recently a case of peritonsillar abscess, in which the abscess had broken spontaneously with considerable relief to the patient. There was very little swelling to be seen, yet the patient seemed more seriously ill than one would have expected. He had not seen the case again, but had heard that the man died shortly afterward supposedly from mediastinal abscess.

Dr. A. E. Abrams asked Dr. Richards why he thought vaccination had had anything to do with the peritonsillar abscess in his case. Vaccination had been very common in this country recently, and he had heard nothing on this subject before.

Dr. George T. Ross, of Montreal, congratulated the author on the thoroughness of his paper, and called attention to a paper read before the Congress in Paris about a year ago on the same subject. The author stated that, in his experience, the supratonsillar fossa was invariably the seat of pus formation. Since reading that paper, the speaker said, he had paid some attention to this point, and when he obtained a history of recurrent attacks of tonsillitis he dissected into the supratonsillar fossa, and in the majority of cases had been pleased by obtaining a confirmation of the statement just quoted. He had usually found an excellent nidus for the propagation of pyogenic germs. He would like to have had something said about the relation of rheumatism to tonsillitis. This subject had been extensively discussed in England, and Sir Dyce Duckworth had brought forward a good deal of information on this point. The speaker said that he had had both tonsillitis and pharyngitis, and a few days thereafter an exceedingly severe attack of acute articular rheumatism.

Clinically speaking, there was no question about the relationship between these two diseases. We saw severe attacks of tonsillitis not only following but antedating rheumatism.

Dr. C. G. Coakley said that he had been very much interested in Dr. Cobb's paper. For many years he had been himself a severe sufferer from peritonsillar abscess, having two or three attacks every year between the ages of fifteen and twenty-five years. In the earlier attacks very free incisions were employed; subsequently the abscesses had not been incised, and he thought his attacks had been less severe and less frequent after having adopted the latter plan. He would admit that there were cases of peritonsillar abscess in which the pus was in a cavity of considerable size, and in these the earlier the incision was made the sooner relief was afforded. There was another type in which pus formed in a number of small foci, and in these cases if the history indicated that but little pus was evacuated by incision and the patient experienced very little relief until later spontaneous rupture of a larger collection, he would advise refraining from incision. As to the question of removing the tonsil at the time of the attack, he would say that he had tried this plan, using cocain and adrenalin, but had never been able to do a thorough tonsillectomy because of the great pain caused by such treatment. These patients were usually considerably weakened and he had not felt like persisting in such efforts. If the parts could be properly anesthetized he would admit that the tonsil could be drawn forward and efficiently treated.

Dr. W. Freudenthal, of New York, referred to the etiology of these abscesses. He thought it was very important to keep in mind the rheumatic origin, for some of these cases could certainly be prevented by antirheumatic treatment. Of course, every abscess was caused by infection, and in many cases this infection originated in the pharynx. If these parts were kept clean, especially in winter, many abscesses would be avoided.

Dr. H. Holbrook Curtis said that in a great many cases he had found marked relief from simple free incision of the tonsil, even though no pus was evacuated.

Dr. Cobb closed the discussion. As to early incision, he said that when pus was obtained by early incision, and the pus was found about half an inch from the surface, relief would be afforded, but his experience had been that if the incision were made early and more deeply, the opening would invariably close, and that the abscess would not break through the cut made, but somewhere else. He had found that such a cut would not give relief for more than one or two hours at the most. He was aware that operating during an attack was rather cruel, but his reason for doing this was that he felt in this way he would know exactly were the pus was, whereas if he operated subsequently he might overlook the shrunken foci containing the pus. His object was to throw the whole cavity widely open, and so efficiently treat the case. The procedure was certainly very painful, but patients were willing to submit to it with the understanding that their chances of permanent relief were better. Incision through the pillar had first awakened his interest in this subject. On making incision in the customary place he had frequently found that the opening closed. He also found that the tonsil had the same relation to the pillars that an iceberg had to water, i. e., about two-thirds would be situated beneath. The pus lies in a triangular space, and if the puncture be made along the line of either the anterior or posterior pillar, the puncture would be along the line in which the pus must lie. On the other hand, by puncturing across this triangle pus might escape detection. He had satisfied his colleagues at the hospital who had believed in the old classical incision that he was right, and they had all changed to the mode of incision which he recommended. One would expect a good deal more bleeding when operating during the attack, but he thought the amount of edema present in these cases prevented much bleeding. When hemorrhage occurred, gauze could be easily packed in between the pillar and the tonsil, and the hemorrhage thus controlled. He was very much interested in the case reported by Dr. Munger. The text books state that septicemia is carried through the glands of the neck and into the mediastinum, but he thought it was more reasonable to assume that the infection passes through the pharyngeal aponeurosis, which is not very thick, and so into the pharyngomaxillary fossa, thus giving a perfectly direct road to the mediastinum. It was unfortunate that an autopsy had not been obtained on Dr. Munger's case. He did not think that any cut made with a knife remained open long enough to afford an outlet afterward for the pus. In the cases that he had traced the pus had discharged at some other point.

Dr. J. F. McKernon read a paper upon

Sphenoidal Abscess.*

Dr. Wendell C. Phillips, of New York, said that he desired to emphasize one point made in the conclusions of the author, i. e., the condemnation of the Wilde's incision. He believed Dr. McKernon took the proper ground on this point. There could be no doubt that if a complete mastoid operation had been done originally, abscess of the brain would not have developed. He wished to emphasize as strongly as possible the necessity for doing a complete mastoid operation at the outset, instead of doing the Wilde's incision first. He had well said that the Wilde's incision should never be mentioned at the present time, except to be condemned.

Dr. B. S. Booth read a paper:

Septum Operations.†

Dr. Edward B. Dench, of New York, said that he could see some advantage in the procedure described, but it seemed to him that in breaking up the septum by this modified Asch operation, no matter how much care was used, the patient would experience considerable shock, and it would be rather difficult to do such an operation in the office and then send the patient home. He had only done one case without an anesthetic, and in that instance he wished he had employed the method just described in the paper. The patient was an old gentleman who did not mind pain very much. The septum was broken up under cocain anesthesia. In all other cases the operation had been done at the patient's home or at the hospital, and under general anesthesia. It seemed to him that the introduction of the tube was almost as painful as the breaking up of the septum.

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*See page 178, May number.

†See page 212, May number.

Dr. Thomas J. Harris, of New York, said he thought he was one of those who had criticised Dr. Booth's previous paper read before the Laryngological Section of the Academy of Medicine. This method described in the paper he had been using for a year or more, but he had never allowed the patient to go out after this operation for forty-eight to seventy-two hours. His experience had been that there had not been very much pain after coming out of the gas in the introduction of the tube, except in the case of very nervous adults or in children. This method seemed to him a very practical one, and one which would give entire freedom from pain.

Dr. George L. Richards, of Fall River, Mass., said that he used general anesthesia for these cases. He did not think it was a good plan to minimize too much the importance of surgical operations. His own practice was to do the operation at the hospital under general anesthesia, and he had entirely given up the idea of doing any operation in so many seconds. He had had very good results from putting a tampon into the nasopharynx and bringing it forward, so that there would be only bleeding anteriorly. He deprecated the idea of attempting to do most of the nose and throat operations in the physician's office and sending the patient home immediately afterward.

Dr. Stephen H. Lutz was of the opinion that the septum could be more thoroughly broken up before being cut. He had done eighteen or twenty operations in this way with good results. A paper on this subject had been presented by him at the last meeting in New York city. He was sure the septum could be more thoroughly broken before it was cut, and then any part which had not been absolutely straightened could be incised.

Dr. George T. Ross, of Montreal, asked what guarantee there was that sepsis would not occur if these operations were done in the physician's office and the patient was allowed to go home immediately afterward. He had read an article on this subject by a gentleman who claimed that sepsis occurred in this way no matter how carefully the operation had been done. A case was cited in this article in which meningitis and death had resulted from sepsis originating in this manner.

Dr. R. C. Myles said that probably 80 or 90 per cent.

of the surgical operations on the nose were done by the method now being criticised. According to his experience these patients did just about as well at their own homes as in the somewhat impure air of hospitals. He had tried various methods of operating upon the septum, but no method had yielded perfect results. He would like to know what was meant by the statement that the septum was thoroughly broken up. He had broken the septum in the cadaver, and had then examined the result carefully. He had seen patients presented in the Academy of Medicine supposed to illustrate good results after septum operation, yet the extent of nasal deformity was such that he felt anxious to operate upon them.

Dr. H. Holbrook Curtis said he thought Dr. Myles had struck the right note when he said that he had tried everybody's method and none had uniformly good results. He had found the imperfect results in Dr. Myles' cases and also in his own cases. The operator was not apt to see his imperfect results, for these patients would go away to some other operator. He had seen a great many bad results, and while the modified Asch operation, described by Dr. Booth, was good, there were others, in his opinion, that were equally good. He had often found that a simple tunnel through the inferior meatus would give good results. Often on observing such a case six months afterward it would be found remarkably improved. The rule should be to get the inferior meatus clear, and the rest would take care of itself in a great many cases.

Dr. C. W. Richardson, of Washington, D. C., said that he had watched and compared carefully the cases operated upon and retained in hospital, and those allowed to go away immediately after the operation, and he was positive that the cases operated upon under a general anesthetic and confined to bed for four or five days afterward usually displayed no fever or symptoms of sepsis, while those allowed to go free usually had some fever or presented some evidences of sepsis, and often found it necessary eventually to go to bed.

Dr. Booth said that he had not found that the patients complained very much of the pain caused by the introduction of splints into the nose. He saw no reason why the patient should stay in hospital after an operation done under nitrous oxide gas any more than the extraction of a tooth under this form of anesthesia. It was the duty of the surgeon to do the operation as quickly as consistent with good results. It seemed to him there was nearly as much likelihood of sepsis developing in patients kept in hospital as in those sent home after the operation. There were, of course, many cases of septum deviation in which a perfect result could not be expected. If the stenosis could be reduced by such an operation a good deal would be accomplished. He tried to loosen the septum up as much as possible from the floor of the nose, and when he could feel it crack and give way he expected a good result. He had not noted any evidences of sepsis in the cases treated in his office in the manner described.

Dr. C. W. Richardson read a paper:

Keratosis of the Fauces.*

Dr. Wendell C. Phillips said that he had had considerable experience in the treatment of these cases, and he had found that a large proportion of them had been among young women. A peculiar fact in this connection was that these women were very fond of pets, such as dogs, cats and horses. Whether this had any bearing upon the etiology or not he could not say. He had never found it necessary to excise the tonsil or do any extensive operation, and he had never failed to effect a cure by galvanopuncture, frequently and thoroughly applied.

Dr. R. C. Myles said that not long since a singer had come to him with the throat, tongue and tonsil covered with white keratoid spots. These had developed rather suddenly and during a time when the patient was on an exclusively milk diet by the direction of a stomach specialist. The only thing which cured these cases was the thorough destruction of the submucosa. He had reported a case in which he had succeeded in curing all the spots except one on the tonsil. This one spot had remained for a year or more.

Dr. M. D. Lederman, of New York, referred to a very extensive mycotic condition of the fauces and tonsil discovered in a man of 35, incidentally in the course of an examination of the throat. The patient was a male. Formalin had been very highly recommended in the recent literature. It was to be applied in 10 per cent. solution after cocainization.

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*See page 187, May number.

Dr. N. L. Wilson, of Elizabeth, N. J., said that a few months ago he had tried the formalin treatment very thoroughly in a case, and as there had been but little improvement, the patient had been advised to take a sea voyage. This was done, and it was well on his return. The patient was a neurasthenic.

Dr. F. C. Cobb, of Boston, said that he had seen keratosis of the tonsil and base of the tongue, and with it even keratosis of the vocal cords and lower part of the larynx. He had never found any application which had any effect upon it.

Dr. H. H. Curtis said that he had had a good many cases of what he called mycosis of the tonsil. He recalled one case which had extended through the nasal duct to the eye, and the same condition was visible on the larynx and pharynx. He had abandoned destruction of this tissue, and now prescribed 10 per cent. pyoktanin in boric acid powder, and taught the patient to massage the parts. This dissolved the tufts most readily and relieved the patient entirely of the disagreeable sensations in the throat. He saw no necessity for destroying the glandular tissue of the throat for a mycosis that would recover in time under simple treatment. Almost every one of these patients that he had met with had been accustomed to eat raw apples, and it had occurred to him that as apples are often licked by animals this might throw some light on the etiology.

Dr. Thomas R. Pooley, of New York, said that in several instances he had observed leptothrix in the canaliculi. In these cases there was considerable fullness of both upper and lower canaliculus. These cases had been readily cured by freely slitting up the canaliculus and by curetting. Several of these cases, observed in Dr. Knapp's clinic, had been reported.

Dr. Richardson said that the sudden appearance of keratosis and its marked tendency to resolution were the chief features. To this must be added our almost total ignorance of the etiology. As he had said in his paper, he believed the best thing to do was to leave it alone if the patient could be persuaded that this was the best course. These cases invariably recover spontaneously. The quills would recur unless the removal extended to the parts below the submucosa.

Dr. T. R. Pooley reported a case of

Epithelioma of the Auricle.*

Dr. W. Freudenthal, of New York, said that Dr. Pooley was to be congratulated upon the excellent result obtained in this case. He had presented to the Section on Otology of the Academy of Medicine a case in which quite an extensive operation had been done on the auricle. On coming to the speaker there was an eroded ulcer on the face and on the auricle, and the patient absolutely refused further operation. He did not wish to cauterize it, and hence he had applied the electric light and oxygen gas, and he must say that so far the result was very satisfactory. The patient had written to him recently, stating that he felt comparatively well, and that only a slight ulceration was left.

Dr. R. C. Myles said that a year or two ago he had presented to the Otological Society the semicircular canals and cochlea of a patient who had had epithelioma of the ear. That patient was to-day perfectly well though without hearing. He had reported a number of cases of epithelioma which had occurred in the mastoid cells. In cases of removal of epithelioma of the tongue the growth always recurred in the neck, but in cases of epithelioma of the ear the lymphatics did not seem to become infected with the disease. These cases were easily cured, and good results were obtained both by the knife and by the use of caustics.

Quite recently in a case of this kind the internal maxillary artery had been injected with paraffin to starve out the growth. He had heard from the patient to-day, and the growth was rapidly diminishing.

Dr. M. D. Lederman, of New York, said that Dr. Pooley was quite fortunate in their not having more contraction of the canal. With reference to the use of the electric light, he would say that an interesting paper had been presented in London by Dr. McIntyre, in which the statement was made that he had seen improvement in lupoid conditions from the use of the x-ray. Coming from such a source this statement was entitled to considerable weight.

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*See page 516.

Dr. Joseph F. Kenefick, of New York, said that not long ago he had heard a preliminary report by Dr. Morton, of this city, on the treatment of malignant growths by the x-ray, and the future of this treatment certainly seemed to be very promising. Judging from the results so far obtained, epitheliomata of the auricle should yield readily to x-ray treatment.

Dr. H. H. Curtis congratulated Dr. Pooley on the excellent result, and the lack of cicatrization, and expressed the opinion that in view of such results one could afford to wait patiently for further reports regarding the use of the x-ray.

Dr. Pooley said that he was at present an agnostic regarding the use of caustics. He had had a long training as a surgeon and could not reconcile himself to any of these procedures when the growths were accessible to clean surgery. It was certainly fortunate that considerable atresia of the auditory canal had not taken place. This was largely due, he thought, to the fact that the growth was very largely limited to one part of the canal and the raw surfaces were consequently not in apposition. Of course, constriction of the canal was to be feared in these cases, because of the contraction of cicatricial tissue. The growth had been examined microscopically by the pathologist of the hospital, and found to be a typical epithelioma.

Dr. W. Freudenthal read a paper:

Rhinitis Rheumatica.*

Dr. Z. L. Leonard read a paper entitled:

Chronic Hypertrophic Rhinitis.

Dr. George L. Richards, of Fall River, discussed the last paper with reference to the operation for removing a portion of the inferior turbinate. When the hypertrophy was considerable, he said, the only method which absolutely relieved the patient was the removal of a portion of the inferior turbinate. He was sorry that the author had not described his operation more in detail. Dr. C. R. Holmes, of Cincinnati, at the meeting of the American Medical Association at Columbus, O., described a method of sawing diagonally from the under side upward toward the middle line against the septum. The saw was used at first, and the operation completed with scissors. In the healing the major portion of the mucous membrane and spongy portion of the turbinal was preserved, and when the healing process was completed the turbinate looked almost normal. Dr. Griffin, in a paper published last year, had described a very similar operation. The results were certainly excellent, but the inferior turbinal would bleed, although not at the time of the operation. He formerly made use of gauze to control the bleeding, but at the suggestion of Dr. Griffin he had used pledgets of cotton which were more easily removed at the end of forty-eight hours. The cotton was wrapped up firmly into a pledget, dipped in full strength solution of peroxid of hydrogen and an antiseptic oil, and then pushed up against the cut.

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*See page 167, May number.

Dr. Carl E. Munger, of Waterbury, Conn., took exception to the statement made in the last paper, to the effect that preference should be given to operations on the turbinal rather than upon the septum. It seemed to him that the septum or the turbinal should be treated depending upon which one seemed to be the source of the trouble. As little as possible of either should be sacrificed.

Dr. M. D. Lederman remarked that punk would not adhere to the wound as did cotton and gauze.

Dr. Conrad Berens, of Philadelphia, said that there was a true hypertrophy of the inferior turbinal bone, and also a hypertrophy of the mucous membrane overlying the same. When there was not true hypertrophy of the inferior turbinal, orthochlorophenol, as recommended some years ago by a Russian physician, would be found a most satisfactory application. A pledget of cotton wrapped tightly on a probe was dipped in this agent and applied after having cocainized the part. The application should be literally massaged into the part. The immediate result was an enormous swelling followed by the exfoliation of a gelatinous mass, and subsequently by a practically permanent contraction.

Dr. H. H. Curtis asked if the application of the orthoclorophenol was as efficient as chromic acid.

Dr. Berens said that, under the instruction of the late Dr. Harrison Allen, he had been taught to use the chromic acid bead, and he had followed those instructions most faithfully, but orthochlorophenol was far superior to it.

Dr. R. C. Myles suggested that the cases should be better classified. Many patients suffer from a mixed condition, a base of hypertrophy with the addition of an intumescence. He had noticed the pendulum's swing from the removal of the entire turbinal to the slightest cauterization, and he believed it was a question of the proper selection of cases. If trichloracetic acid were applied to the milder forms of hypertrophy it would give temporary benefit; monochloracetic acid would act more deeply, and chromic acid would act still more deeply. He had found that the electro-cautery used with an extremely small tip, passed slowly from the back to the front and straight through the tissue, followed by monochloracetic acid applied carefully so as to substitute the eschar of this acid for the electrocautery eschar, would usually give the best results. If the turbinate were very abundant, he sometimes used the cold snare if he feared hemorrhage, but he preferred the use of the scissors.

Dr. Francis J. Quinlan, of New York, expressed surprise that no allusion had been made to the presence of lymphoid hypertrophies even in adults. Sometimes these remained even to advanced age. Sometimes these vasomotor hypertrophies were known to cause a great deal of annoyance. In more than one instance had he cauterized the inferior turbinal, and yet in a month or two the patient had returned with a large amount of redundant tissue. Latterly he had found that going into the vault with his finger he had encountered little nodules that had interfered with the return of the blood. After the removal from the vault of fifteen or twenty drops of blood he had at times been amazed at the reduction of the tips. This simple measure of depleting the pharyngeal vault would enable us to overcome the slight hypertrophies of the turbinal.

Dr. F. C. Cobb endorsed what had been said by the last speaker. He recalled the case of a young woman who had such enormous hypertrophy that neither the cautery nor anything else had any effect. After removal of the adenoids from this patient he had watched her for two years, and during this time he had found no swelling of the turbinates, although this had existed for at least a year previously.

Dr. Corwin endorsed the statement that had just been made by the two preceding speakers as to the effect of removing adenoid tissue in the vault upon the circulation in the anterior part of the nose. With regard to the hemorrhage following excision of portions of the inferior turbinal, especially the anterior part, he would say that in all the operative procedures of the nose he had obtained better results from avoiding the introduction of any packing whatever. He insufflated on the operative field some powder, usually nosophen, and carefully instructed the patient with regard to what regimen should be followed for the first twenty-four hours. The patient was told to avoid anything which would tend to make the face red. If bleeding occurred, he was instructed not to assume the recumbent position, but to avoid all sources of mental excitement, as well as the drinking of warm fluids or sitting near the fire. Occasionally he gave the patient a solution of adrenalin to use cautiously, but ordinarily it was not necessary even after a most extensive operation.

Dr. H. H. Curtis said with regard to the paper on rhinitis rheumatica, that he was glad that this subject had been brought up again because he thought specialists were prone to neglect constitutional conditions. He recalled various cases of his own that might perhaps have been better treated by a proper consideration of this subject.

Dr. Z. L. Leonard said, in closing the discussion, that one of the points alluded to in his paper was the matter which had been brought out more in detail by Dr. Freudenthal's paper, and which seemed to have been lost sight of in the general discussion, i. e., the rheumatic or gouty diathesis behind many of these cases. It was taken for granted by him that before any surgical interference was attempted upon a hypertrophied turbinal that the vault was thoroughly clean. The time was when after an operation on the middle or inferior turbinal body it was packed as firmly as possible with long strips of gauze, and in those days the physician was frequently called up at night because of hemorrhage; but since adopting the plan of clearing away all the small portions of stringy material left after operation, using preferably Holmes' scissors, and applying adrenalin on a small pledget of cotton, there had been little trouble. The patient should be put to bed and kept perfectly quiet, and cold applications applied to the nose externally. There might be some bleeding at the first change of dressing, but that was usually very trivial if peroxid or hydrogen were used to soften up any adhesions that may have formed. He had no intention of bringing out any new thing, but rather to recapitulate the best methods of treatment.

Dr. A. B. Duel reported a case of

Laryngeal Stenosis Following Intubation.

Dr. N. L. Wilson asked if Dr. Duel had had any experience with the tube falling down into the trachea after splitting the larynx.

Dr. Root said that he had been deeply interested in the paper of Dr. Duel. He had himself had a large experience with intubation, and he could endorse the views expressed in the paper. He recalled a recent case of stenosis occurring in a woman in whom he had done a tracheotomy first to allow the patient to get used to the tube. Later on the cicatricial tissue could be dissected out. He was greatly indebted to Dr. Duel for the suggestion that the tube should be retained for a long time. Intralaryngeal stenosis whether due to croup, diphtheritic infection or chronic in its nature, also caused the physician great anxiety. He thought most of the tracheotomies should be done under cocain anesthesia. Such operations could be done without causing pain and could be performed better than under general anesthesia.

Dr. Duel said the retaining tube was put in primarily to avoid the constant auto-extubations which made reintubation frequently necessary. The great point was to leave the tube absolutely undisturbed for a number of weeks. In a case in which he did a thyrotomy, because after placing in a tube which fitted the trachea it was constantly coughed out, he would be inclined to place around the tube something much smaller than the present retaining device in order that it could be readily pulled out. Possibly two or three strands of silk would suffice for this purpose.

Dr. Cobb asked if there was not an intubation tube made with a little tube screwing into the other tube.

Dr. Duel said that he had heard that such a tube was made, but the instrument maker told him that it was impossible to make a tube in this way and have it securely fasten. A metal tube could not be left in for the desired length of time without a good deal of corrosion and clogging being produced.

Dr. T. J. Harris read a paper:

Temperature After Mastoid Operations.*

Dr. N. L. Wilson expressed his personal thanks to Dr. Harris for this paper, because it was a subject which had caused him some uneasiness. In talking with colleagues who were in the habit of doing appendicitis operations, he had learned that it was not unusual to observe the same thing after these operations, although the patients did perfectly well.

Dr. C. G. Coakley said that he had a case which had given him a good deal of worry. A child had had measles in November, and in December had developed mastoid disease. Two or three days after the operation the child had a temperature of 102° F. for a day or two. It then dropped to normal for two or three weeks, and again ran up to 101° or 102.° The wound healed up entirely, yet at the present time the child was still running a rectal temperature of 99° or 100° F. Sometimes the temperature would be higher in the morning; at other times it would be higher in the afternoon. No malarial plasmodium had been found in the blood.

Dr. G. B. McAuliffe, of New York, said that he had come to the conclusion that every case having an elevation of temperature after operation was septic. It was formerly the practice to call this traumatic fever, and it was supposed to be in proportion to the amount of tissue injured.

Inquiry had shown that if thorough asepsis had been secured, and all diseased tissue removed, the fever would subside. He recalled a case in which a surgeon had done a most extensive mastoid operation, and the temperature remained normal, showing that fever did not occur after operation as a result of the extent of tissue attacked.

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*See page 286, May number.

Many surgeons were content to secure drainage, and would leave many pockets improperly cleaned out. He had seen children of two or three months in whom there had been no elevation of temperature after mastoid operation, although many surgeons claimed that fever almost always occurred in these young subjects after such operations.

Dr. Harris said he felt sure that Dr. McAuliffe could not be right in this matter because the cases that he had studied had been under the charge of many different operators, and he was familiar with their work. He was sure that these men were accustomed to do very thorough aseptic work, and yet only one out of one hundred cases showed an afebrile temperature after the operation.

Dr. H. N. Hoople read a paper upon

Empyema of the Antrum

of which the following is the author's abstract:

The air cavities of the bones of the face have some important function to perform aside from incidentally contributing to the lightness of structure of the bones enclosing them. This function is doubtless connected with their form and relation to each other and to the nasal chambers. The frontal, ethmoidal and maxillary sinuses are so placed as to have a common opening into the hiatus semilunaris situated about the very middle of the nasal breathway—practically three flasks with one common mouth over which the wind plays. The effect of this mechanical arrangement is to utilize the principle upon which an atomizer works, viz., that of the Sprengle air pump, the effect of which is to increase evaporation from the air cavities and thus cause abstraction of heat from their circumjacent tissues to effect a process of cooling which contributes to their comfort.

The result of impaired function in these same cavities would be reduced comfort. Were they absolutely closed cavities, from accident or pathologic causes, they would become water-logged, so to speak, and create ache and discomfort in the surrounding tissues. Clinically the constant testimony of those who have a cold in the head, an influenza, or a sinusitis of one or more of these air chambers, or other pathologic condition of their nerve and blood supply, is that a sense of fulness exists in and around the face and forehead, the head feels compressed and heavy, the faculties are dull and irresponsive, the memory fails, concentration is impaired and altogether an indefinable sense of ill-being exists which the patient is seldom able to express satisfactorily to himself or to the physician. This lurking and obscure sense of great discomfort is one of the characteristics of this disease which I mentioned first and place in highest relief in treating of its pathology, thereby indicating that there is one certain and pathognomonic symptom of empyema of these sinuses except it be this ill-defined but positive and distressing disturbance of the nervous system.

The poverty of the blood supply to the thin lining of these air cavities explains the relative paucity of granulations found when chronicity of inflammatory process is considered and also the rarity of some hemorrhage in these cases. Yet Scheppegrell, in 1894, met with a case of such severe hemorrhage from the antrum that it had to be kept packed for four weeks to avoid fatal issue. He supposed an angiomatous condition of the mucous membrane. Lücke gives a case in a man of twenty-six years in whom bleeding characteristic of a vascular tumor occurred requiring packing. After a chiseling operation hemorrhage was so profuse that transfusion was done to save the patient.

I have elsewhere described a case in which alarming hemorrhage took place. It was a case of double ptosis with diplopia in one having almost normal respiration but vision reduced to $^4/_{10}$ with each eye. Nasal faults were corrected. The third operative step freed the left middle turbinate from adhesion to outer wall of the middle meatus and crushed its bulbous anterior end. Three days after that his remaining photophobia had gone, his diplopia had greatly lessened and his ptosis was appreciably less. Twelve days subsequently his vision was $^6/_{10}$ with each eye and the ocular muscle tests were greatly improved. Five days after that, i. e., three weeks after freeing the anterior end of the left middle turbinate, he had profuse bleeding and free flow of yellow pus from the left nostril. There had been no pus flow before this. It was foul-smelling. Enough of the left middle turbinate was removed to give free access to the ethmoid cells and maxillary sinus. A tampon of cotton dipped in carbolic solution was retained two days. Its removal was followed by hemorrhage and flow of yellow pus. The left molar bone and the last upper left molar teeth were tender now for the first time. Throbbing of the temple and tenderness of the scalp were also complained of. With the second tampon *in situ* a second hemorrhage occurred two days later. A further and more severe and blanching hemorrhage followed the same night, after which pus discharge alone continued for some weeks, when all diplopia and other eye-symptoms were completely gone, the vision being restored to $^8/_{10}$ with each eye which subsequently went on improving to $^{10}/_{10}$. This rapid evolution of a suppurative condition was regarded at the time of its being reported as having been lacking in definitive characteristics of antrum involvement, one instancing the non-employment of transillumination and another invoking the *argumentum ad personem*, he never having seen a chronic empyema get well without radical opening. Another claimed the frontal or the ethmoidal sinus must have been the one involved.

The author cites Jonathan Wright's estimate of transillumination—wholly untrustworthy for diagnosis—points out the unjustifiability of exploratory puncture in a case which was getting well without it, and reminds his critics of recoveries instanced in both acute and chronic cases.

A summary of the literature is given covering the views as to pathology and etiology.

Dr. J. C. Lester read a paper entitled:

Extrinsic Nasal Neoplasm.*

Dr. Lester also exhibited a patient with an epithelioma of the orbit of eighteen year's standing. The growth was first considered to be lupus, but the pathologist had recently reported it to be epithelioma. The patient stated that the growth had nearly disappeared at one time under the use of the x-ray. The case was presented because he intended to subject it to x-ray treatment.

Dr. C. Berens read a paper:

Empyema of Frontal Sinus.

Dr. C. G. Coakley said that he had listened attentively to the paper of Dr. Hoople, but had failed to learn that a positive diagnosis of antral disease had been made in that case. There had been no transillumination although there had been some pain in the region of the antrum. The antrum had not been washed out to make certain that it was not involved. It had occurred to him that the ethmoid cells or the frontal sinus, or possibly even the sphenoidal sinus might have been the part involved instead of the antrum. When there was a very extensive change in the mucosa of the antrum recovery was not apt to occur so easily as in the case reported.

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*See page 200, May number.

With regard to the second paper, he would say that he heartily agreed with the author's conclusions regarding the advisability of early and thorough operation in cases of frontal sinusitis.

Dr. A. G. Root, of Albany, said that in his brief experience he had never seen a case of granuloma either completely or partially filling the antrum, and causing considerable pus formation and hemorrhage, that had ever recovered without a free opening into the antrum and cleaning it out. If such a procedure were indicated, no intranasal operation, in his judgment, would suffice. The procedure was to open into the antrum after raising the cheek. The finger should be introduced and the cavity explored. Through and through drainage should be secured, if necessary by the removal of the tooth. If there was a growth present which gave rise to pus and hemorrhage, there was reason to believe that it was malignant, and not a granuloma. If the growth were malignant, then the operation indicated was its removal.

Dr. F. C. Cobb said that the antrum was often filled with pus without there being any cause for it in the antrum itself. If the ethmoidal cells were opened, the antrum need not be itself opened. Some of the cases cited might have been examples of affection of the ethmoid, the antrum simply serving as a reservoir for the discharge from the upper sinuses.

Dr. Francis J. Quinlan said that he had demonstrated before the Laryngological Section of the Academy of Medicine a radical operation that he had devised, i. e., the removal of the anterior wall. These cases of empyema of the frontal sinus should be treated radically like the mastoid. It was no more serious to dissect back the periosteum and the flaps, and chisel and curette away all the disease than it was to make a puncture. He had had 16 cases, and in the four last he had done a radical operation, and had established no drainage of consequence through the nostril. In two of the cases he had injected paraffin, and there had been almost no deformity.

Dr. Conrad Berens, of Philadelphia, said that in his paper the incisions described were exceedingly large, the little finger being passed in from side to side. There was no better filling up of the tissue after the so-called radical operation than after doing the ordinary operation in a radical way, i. e., laying the parts open so that a good view could be obtained, and all diseased tissue removed. He claimed that the resulting deformity was less, and that the wounds healed more satisfactorily. In one of his cases practically all of the bony tissues were destroyed by an abrupt necrotic process. Such a case could not be said to be due to the infiltration of pus down into the antrum of Highmore and then into the orbit. Every case was known by the aspect which it presented at the time. All cases could not be treated alike, and each one should be treated on its individual merits and not according to any one plan.

Referring to Dr. Hoople's paper, he said that he had seen a great many of the cases described there; the whole trouble lay with a faulty diagnosis at the beginning.

Dr. G. L. Richards said that he had presented to the society a paper in which he had advocated a free incision in the treatment of frontal sinusitis. Last summer he had had an opportunity of seeing some of Jansen's cases, and he was sure no one was considered to be more radical than he. The deformity in those cases was frightful, and would not be tolerated in this country by many patients.

BOOK NOTICES.

Studies of the Internal Anatomy of the Face.

By M. H. Cryer, M. D., D. D. S., Prof. Oral Surgery, Department Dentistry, University of Penna.; with 151 illustrations from dissections by the author. pp. 176. Philadelphia. S. S. White Dental Mfg. Co.

Those members of the Section on Laryngology and Otology of the American Medical Association who have witnessed Dr. Cryer's demonstrations of the anatomy of the nose and accessory sinuses and handled his specimens will most heartily welcome this book: while all workers in the field of rhinology and dentistry will find it a mine of information as regards the bony anatomy of the face. Dr. Cryer has had made photo engravings of the most valuable of his specimens. The book consists of these engravings printed on plate paper with sufficient explanatory markings to make all the plates clear. The descriptive text is brief and concise.

Dr. Cryer does not believe that there is any precise normal type as to the internal anatomy of the face; that which we commonly regard as such being a composite. In pursuing his studies hundreds of sections of the facial region have been cut and examined. From these dissections he concludes that the accepted descriptions can not be depended upon or followed literally as a guide for surgeon or dentist.

He brings out many points of particular interest to rhinologists; among them the following:

Secondary bone deposit of inflammatory origin in the cortical and cancellated tissue of the face is an important factor in producing facial neuralgia. In the individual case it may be difficult to determine the cause of the neuralgia.

Devitalized molar teeth may cause swelling at the angle of the jaw which simulate enlarged submaxillary glands.

In extracting molar teeth from the upper jaw there is danger either of carrying away a portion of the floor of the maxillary sinus or by injudicious use of the forceps of forcing the roots into the sinus, as "in the majority of the skulls of the white race so far examined, roots of the molar teeth pass up into the walls of the antrum, being covered at the point where they approach the surface by only a thin conical portion of bone." The common idea of rhinologists that a straight septum is unusual is probably due to the fact that the great majority of cases which they examine are abnormal.

Dr. Cryer makes the statement that the inferior meatus is the principal passageway of respiration. This statement will be regarded as an error by most rhinologists, as all the experiments seem to show that the middle meatus is the main channel for the entrance and exit of air. He states that "A sound cannot be passed from the nasal chamber through the ostium maxillare into the maxillary sinus in a normal living person." This is an anatomical point which has been somewhat discussed. Some rhinologists seem to be able to reach and treat the antrum through the natural opening, while others, of which the reviewer is one, find great difficulty in so doing. Recently Fisk has proposed to treat hay fever by insufflating aristol through the natural opening. If this statement of Cryer's is correct the procedure is impossible in the normal individual and doubly so when in the swollen condition incident to hay fever. He has never found a complete bony septum in the maxillary sinus; partial septa are common, either bony or membranous. The opening into the maxillary sinus, he thinks is arranged at the top so as to prevent undue loss of fluid while the subject is lying on the back or standing and does not regard it as arranged for drainage. The other openings into the air cells or sinuses are arranged so as to make almost complete drainage.

While recognizing that diseases of the antrum do arise from the teeth he believes that aside from constitutional diseases and malformations it is more often through the common communication between the nasal chamber, the frontal sinuses, the ethmoidal cells, and the maxillary sinus that infection is conveyed to the antrum from diseased cells and sinuses above it. It is the his observation that there are more cases in which teeth are lost through diseases of the antrum than cases in which the teeth are primarily diseased, causing infection of the antrum and associated cells. "Careless operation by the dentist sometimes causes infection of the sinus, as drilling through the tooth and the floor of the sinus, or forcing the root of a tooth into the sinus, though fracture of the wall in an unskillful effort to extract, or carelessness in drilling artificial crowns or bridges upon the teeth or roots."

A chapter is devoted to variations in the anatomical structures of the face with deductions therefrom, and another to the effects of pathological conditions in the region of the hiatus semilunaris. The latter portion of the book is of more especial interest to dentists.

The mechanical execution of the work reflects credit on the publisher. This book is an original contribution of value to the bony anatomy of the nose and accessory sinuses, and as such is commended to the attention of every rhinologist. RICHARDS.

Atlas der Krankheiten der Nose, ihre Nebenhöhlen und des Nasenrachenraumes.

By Privat-docent Dr. P. H. Gerber, Königsberg. Published in Eight Sections, by S. Karger, Berlin: 6 marks per Section.

This is really a serviceable atlas, one made for actual use. The pictures are true to nature, both in color and in design. Practically every condition affecting the nose and accessory cavities is depicted, as shown by the following list:

Normal rhinoscopic view with narrow and with wide accessory cavities.

Normal rhinoscopic view with the head drawn to one side.

Normal rhinoscopic view after cocainization.

Hypertrophy of the uncinate process.

Hypertrophy of the uncinate process with atrophy of the mucosa.

Bulla ethmoidalis.

Varieties of septal deviations (particularly fine).

Dislocation of the edge of the cartilage of the septum.

Normal epipharynx.

Recessus medius (various types).

Atresia of the choana.

Anterior synechia.

Synechia between palate and pharynx.

Membranous atresia of the choana.

Epistaxis from varicosities of the septum.

Rhinitis sicca anterior.

Ulcer of the septum.

Septal abscess.

Perforation of the septum.

Acute rhinitis.

Blenorrheic rhinitis.

Postnasal catarrh (diffused and localized).

Cyst in the recessus medius.

Rhinitis and epipharyngitis fibrinosa.

Epithelial metaplasia of the inferior turbinate.

Papillomatous degeneration of the nasal mucosa.

Atrophic rhinitis (13 figures).

Hypertrophic rhinitis (all varieties, anterior and posterior).

Papillary hypertrophy.

Hypertrophy of the epipharyngeal tonsil (the best set of pictures thus far published).

Nasal polypi (a thorough exposition of variety, size and position in the nose).

Bleeding septum polyp.

Fibroadenoma.

Fibroangioma.

Epipharyngeal fibroma.

Osteoma of the nose.

Malignant neoplasms.

Cyst of the bulla ethmoidalis.

Lipoma.

Nasal calculus.

Tooth growing in the nasal cavity.

Diseases of the accessory cavities (a very extensive set of plates).

Lupus and tuberculosis.

Syphilis.

Deformities.

Leprosy.

Where there is so much commendable it is superfluous to dwell upon individual points of excellence. The work desreves a generous reception.

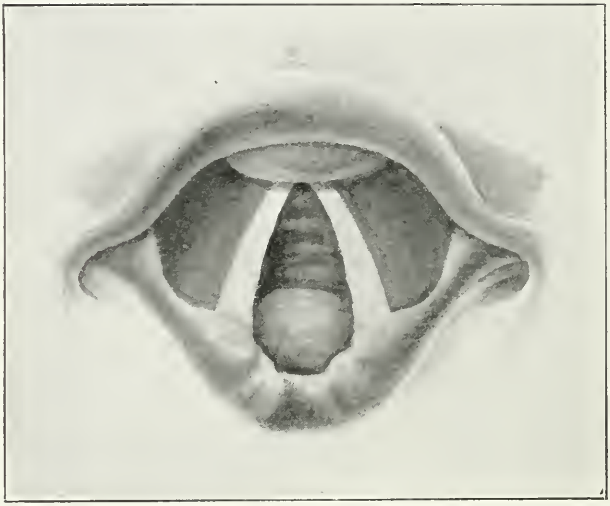

Fig. 1. Quiet inspiration.

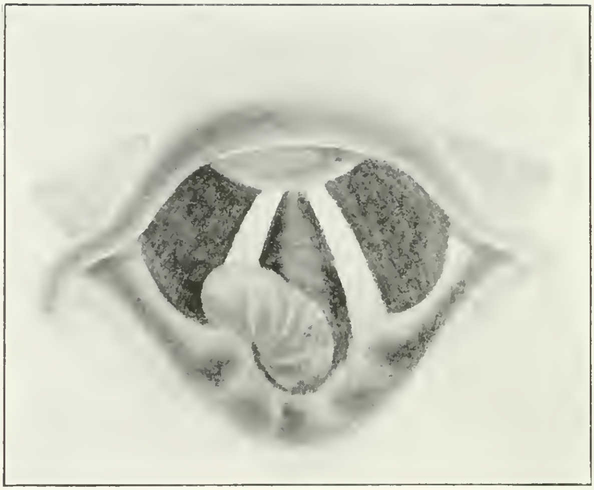

Fig. 2. First part of expiration.

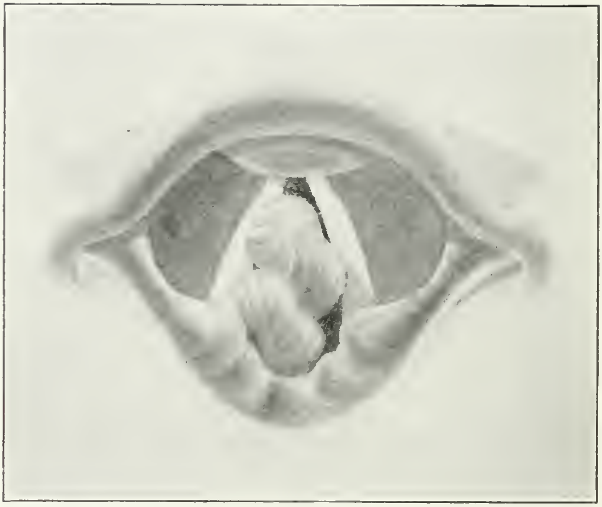

Fig. 3. Completion of expiration.

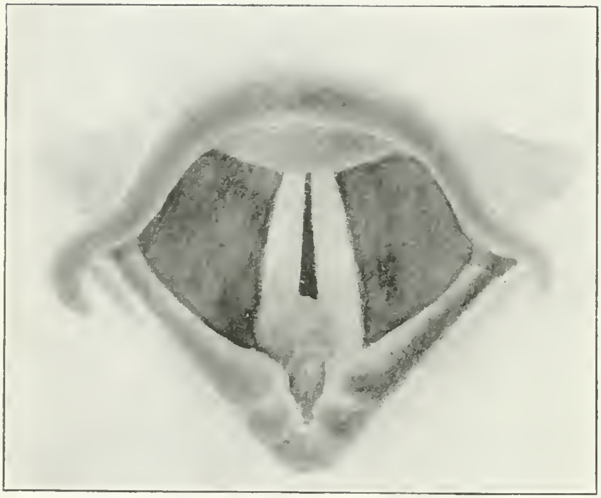

Fig. 4. Phonation.

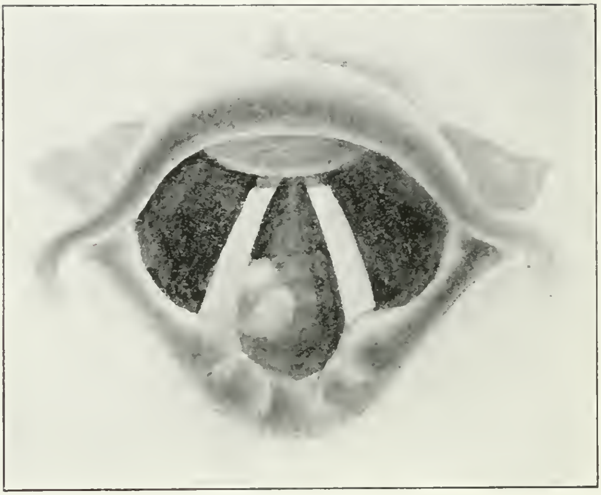

Fig. 5. Quite expiration, head turned to the left.

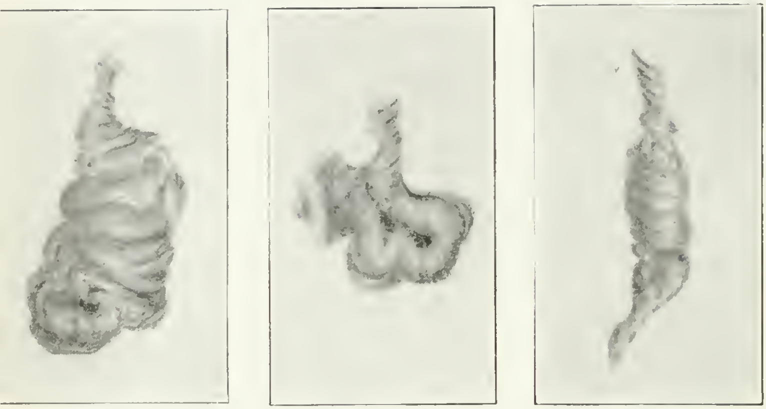

Fig. 6. The three tumors removed at the first sitting.
Double their natural size.

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LARYNGOLOGY.

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LV.

FIBROPAPILLOMA OF THE LARYNX WITH UNUSUAL MOVEMENTS.

By Hanau W. Loeb, A. M., M. D.,

ST. LOUIS.

Movable tumors of the larynx are very common; almost all writers upon laryngeal neoplasms mention their occurrence. Their movements may depend upon their attachment to the vocal bands or upon the existence of pedicles. To the latter class belongs that group of new growths so attached and so pedunculated that the incoming or outgoing current of air changes their position in the larynx during respiration and phonation. Posture likewise influences their relations and frequently the symptoms which they occasion.

In Morell Mackenzie's detailed description of the first hundred laryngeal growths treated by him, numerous instances are given of such cases.[1] The following may be noted:

A housemaid, aet. 24, had a small pendulous papillary growth seen between the anterior commissure. On inspiration, it appeard comparatively small, and quite free of the vocal cords; on phonation, it was almost invisible, and on forced expiration it rose above the level of the cords.

A woman, aet. 45, had a movable pedunculated growth, seemingly attached to the right ventricular band. On inspiration a portion of the right vocal cord could be seen but on forced expiration, the growth was pushed upward and across the larynx, so as to conceal the right vocal cord and part of the left.

A boy, aet. 17, had a papillary tumor extending over almost the whole length of the left vocal cord; upon inspiration it was drawn down, occupying about half the area of the glottis while upon forced expiration it occupied almost the whole of the glottis.

A nursemaid, aet. 23. A long filiform growth was seen to be attached to the right cord near its anterior insertion. The growth occasionally hung down in the glottis, and at other times, lodged between the vocal cord and ventricular band.

Similar accounts have been made by other observes and doubtless the vast majority have never found a place in literature. Still it may be well enough to mention the following which have some bearing upon the case which is made the subject of this paper.

Baldwin[2] described a large papilloma which was attached by a rather broad base to the edge and upper surface of the left vocal cord, and to the anterior angle between the cords. During inspiration, the tumor would flap across the chink obstructing it momentarily, then as the inspiration effort increased, it would be drawn below the cords allowing the air to enter.

Jurasz[3] relates a case in which there was a growth with a long pedicle attached to a ventricular band; the growth was sometimes above the glottis and sometimes below, often acting as a foreign body when it was thrust against a sensitive portion of the larynx, such as the laryngeal surface of the epiglottis or the plica interarytenoidea.

Navratil[4] reports a case of a man, aet. 48, in whom there was a laryngeal polyp about the size of a plum, springing from below the anterior commissure and appearing above the vocal bands on expiration.

Swiezynski[5] gives the history of several cases of movable polypi of the larynx. In the first case, a tumor about the size of a large pea, attached to the left cord, fell between the cords on phonation. A second case was that of a man, aet. 30, in whom the attachment of the growth was upon the anterior portion of the right cord, while on phonation the tumor was concealed below the left cord.

The case I now report shows some points of difference from those just mentioned, and is altogether more definite as to the movements exhibited.

Miss A. B., weaver, single, 38, consulted me on November 30, 1901, at the instance of Dr. W. A. McCandless. Previous history unimportant—an attack of small-pox at the age of 5 or 6, otherwise she had been in good health. Mother died of uterine cancer at 63 years of age and father died very old; cause of death unknown. Her symptoms began about six years ago, with some hoarseness and difficulty in breathing. The hoarseness had continued, but at present it seemed that there was some obstruction in the larynx which interfered with phonation. The difficulty in breathing had never been very marked until a few days ago, when she had a severe attack of dyspnea during which she was almost suffocated. She is not certain just now how the attack developed, beyond the fact that she had been awakened during the night by difficult breathing. She endeavored to relieve herself by taking a glass of water and immediately lost consciousness, remaining unconscious and in imminent danger of suffocation for an hour and a half. The details of this attack were very difficult to obtain, as it occurred in the night, and as no physician arrived in time to witness it.

Careful questioning elicited the following facts relative to her breathing: There was a little obstruction to inspiration, but more or less interference with expiration. As she expressed it, there seemed to be a weight preventing the complete emptying of the chest. In lying down on the right side, breathing was fairly easy, but the patient could not lie on the left side more than a few moments on account of the dyspnea which would supervene. She was comfortable when lying on her back—much more so than when lying on her abdomen.

Altogether she had had little annoyance from her condition as she accommodated herself to the postural requirements. It was the sudden attack of dyspnea and the fear of another that impelled her to seek further medical advice. She had been treated by various physicians for catarrh, asthma and laryngitis, but without avail.

The patient was a strong, well-nourished woman whose breathing did not indicate any material laryngeal obstruction. Her voice was jerky and ineffective as if there was some obstruction at the glottis.

Examination of the nose and pharynx showed nothing except hypertrophy of the lingual tonsil. Epiglottis, arytenoids, ventricular bands and superior surface of vocal bands presented nothing abnormal.

On inspiration, there seemed to be a growth of some character on the posterior wall of the infraglottic portion of the larynx and trachea as shown in figure 1. As expiration began a tumor would rise between the cords (figure 2), swinging around from the under surface of the right vocal band and passing into the supraglottic portion of the larynx. As the expiratory act continued a second tumor (figure 3) would rise in a similar way, and surmount the first tumor, almost completely occluding the glottis from view. As soon as the expiration ceased, the tumors fell again into larynx, in the order in which they appeared.

During phonation a similar condition of things prevailed except that as a rule only the first tumor succeeded in getting above the glottis before the cords came together (figure 4).

The indication for treatment was obvious. Accordingly three tumors were removed by the tube forceps, one $12^1/_2$ grains, one 5 grains and $2^1/_2$ grains, the two largest having a long pedicle. The smallest had only a short pedicle which probably kept it from coming into view on expiration, as at no time before the operation had I been able to see it. There still remained a small tumor, which I decided to leave for a subsequent operation, as the patient was not disposed to have me complete the operation at one sitting.

This permitted me to study the movements of the growth, which, though having a much shorter excursion, at least was typical of the larger. Figure 5 shows this growth in quiet expiration, the patient being in the erect position; the expiratory current of air was often strong enough to carry the tumor beyond the glottis, so that it rested on the superior surface of the right cord.

In inspiration, the tumor either disappeared from view, or remained sticking to the superior surface of the right cord, where it had been left by the expiratory blast, its pedicle being bent over the edge of the cord.

When this took place the tumor could be released from its contact with the cord by directing the patient to incline her head to the left. In phonation the tumor generally was forced up between the cords though sometimes they came together before the tumor could pass between them.

It was very evident, from this study and from my view of the larger tumors, that the growths had sprung from the inferior surface of the right vocal band and that the pedicles were so long that an unusual excursion of the tumors was permitted. During inspiration while the patient was in the erect position, they hung in the infraglottic portion of the larynx and trachea and caused practically no obstruction to respiration. This same condition manifested itself when the patient lay on her right side as there was very little, if any, obstruction to inspiration. However, obstruction resulted when she lay upon her left side for the growths, from gravitation, would hang across the glottis inferiorily and so far would interfere with breathing. The slight obstructien to breathing while she lay upon her abdomen may be accounted for by the fact that the growths were attached somewhat posteriorly and therefore encroached upon the anterior portion of the glottis more than upon the posterior portion when the patient was lying on her back.

The supraglottic projection of the tumors on expiration and phonation signifies that the current of air, being expired, was strong enough to lift first one, then the other, above the vocal bands, by virtue of their long pedicles. Altogether this is the most interesting feature of the case, for the excursion of the larger tumor from the beginning of inspiration until the end of expiration must have been at least two inches.

The small tumor, which from its lobular appearance seemed to be two growths, was removed two weeks later, and at a subsequent sitting the hypertrophied lingual tonsil was removed with a cold snare. The patient is now (May 28, 1902) entirely well, with no sign of a growth.

The tumors proved to be fibro-papillomata, the connective tissue elements being very abundant and the papillas much enlarged.

The points of interest are the following:

1. The slight interference with respiration. Consider-

ing the large size of the tumors removed it might seem strange that there was not more obstruction to respiration. Certainly if the growths had been attached above the cords, the interference would have been much greater, since the glottis would have been lessened in size instead of the more capacious trachea. In this position too, it is hardly to be doubted that the symptoms from the presence of the tumors would have been much more urgent and would have called for removal before they attained so large a size. In most of the movable tumors reported, the attachment was above the glottis.

2. All of the tumors were pedunculated and hung from the lower surface of the right cord. What was it that encouraged the development of these tumors, all pedunculated, in this location and no where else in the larynx?

3. The movements of the last tumor removed were similar to those of the larger growth. In each instance, the expiratory current caused the growth to pass over the free edge of the right cord into the supra-glottic portion of the larynx.

4. The single attack of severe dyspnea coming on at night was probably caused by the growths being held in the expiratory position, by one of the tumors twisting around another, necessarily diminishing the size of the glottis.

5. Absence of aphonia. The single tumor which appeared above the cord was not sufficient to produce aphonia, its only action being to render the voice jerky, thin and strained. In this connection it may be mentioned that Gottstein[6] states that the voice may undergo frequent changes where a pedunculated tumor is present in the larynx, since during inspiration the growth is drawn below the vocal cords and during expiration it may be suddenly forced between them.

6. The movements were very easy to observe. A large number of practitioners unaccustomed to the use of the laryngoscope readily recognized the condition of things, namely tumors in the larynx, which upon expiration arose from below the cords to a position almost at the level of the superior border of the epiglottis.

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[1] Morrell Mackenzie.—Essay on Growths in the Larynx.
[2] J. F. Baldwin.—Medical Record, 1890, p. 268.
[3] Jurasz.—Heyman's Handbuch; Kehlhopf und Luftrohre, p. 833.
[4] Navratil.—Centralblatt fur Laryng., etc., XV, p. 46.
[5] Swiezynski.—Arch. fur Laryng., VII, p. 149.
[6] Gottstein.—Krankheiten des Kehlköpfs.

LVI.

NOTES ON THE DEVELOPMENT OF THE PHARYNX AFTER BIRTH.

By Thomas Dwight, M. D., LL.D.,

PARKMAN PROFESSOR OF ANATOMY AT THE HARVARD MEDICAL SCHOOL.

There are two phases of human anatomy of great practical importance in medicine which are as yet almost unknown to other than professed anatomists. These are the range of individual variation, and the progress of development after birth. Embryology has indeed done great service to science, but it is a field that experts only can till.. Moreover it is discouraging to find, as we have again and again, that what has been taught as certain is later shown to be wrong. This does not apply merely to details, where in fact it would be expected, but sometimes to points of almost fundamental importance. Now the study of post-natal development is one that can be undertaken by anyone who can command comparatively simple apparatus. Much is thus to be learned.

The development of the pharynx, of which the larynx is an outgrowth, is a case in point. The infant's skull is very different from that of the adult in many respects besides its size. In fact the latter is one of the least important. In other words it is practically all cranium. The face is but an insignificant outgrowth. The orbits are relatively large because they are the cases of sense-organs which almost at once become functional; but the face below them is very small. The reason is that the face is essentially composed of the jaws, and the jaws are for the accommodation of teeth. (Note by way of illustration how in the second childhood after the loss of the teeth the jaws atrophy and the face shrinks.) A side view of the skull of an infant compared with that of an adult tells much of the story. A rough and ready method of placing the adult head in its proper position is to have the upper border of the zygoma horizontal, or rising to a minute degree toward the front. Applying this method to the infant skull one is struck by the fact that the face does not descend in front as in the adult, but that the lower jaw comes but little below the level of the occiput. There is no antrum of Highmore. The little rootless teeth, reposing in their tooth-sacs, extend from the roof of the mouth to the floor of the orbit. The ramus of the lower jaw is very short and the angle a very obtuse one. A striking statement of the peculiar shape of the face is that at birth its breadth is to its height (i. e., to the top of the orbits), as 10 to 4, while in the full grown head it is as 9 to 8.

A median section of either a frozen head or of one hardened by formalin gives even more important information. The basilar process instead of ascending is nearly horizontal, the posterior border of the vomer slants strongly forward, the nasal fossæ are very shallow (vertically), the hard palate if prolonged backward would strike at about the junction of the basi-occipital and the sphenoid. The rather patulous mouth of the Eustachian tube, which in the adult is on a level with the inferior turbinate, is, if anything, below that of the hard palate. Seen from behind, the posterior nares are two nearly round holes, 5 or 6 mm. in height and a trifle broader.

The real danger of a cold in the head at the beginning of life is thus evident.* The naso-pharynx hardly exists. It is not a chamber, but merely a passage from the nose, curving down behind the palate. It is very small, but by way of compensation it is without a pharyngeal tonsil,† or the collections of adenoid tissue about the openings of the Eustachian tubes.

To return to the median section, the outline of the tongue is both peculiar and characteristic. It is relatively long, because the vertical diameter is strikingly less in proportion than later. Now the tongue arises chiefly from the hyoid bone, and this being attached to the mylo-hyoid ridge of the lower jaw by the muscle of that name, is necessarily in a tolerably fixed relation to it. The larynx in turn is suspended from the hyoid, and thus it is clear that any changes in the position of the larynx must, at least to a great degree, be concomitant with and dependent upon those of the face. As the face grows down the larynx must descend with it.

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*The Head and Neck in Infancy; by the writer in conjunction with Dr. T. M. Rotch. Archives of Pediatrics, Vol. VIII., Sept., 1891.

†It is not meant to deny the presence of the early stages of adenoid tissue in the mucous membrane, nor even the occurrence of ridges on the top of the pharynx, but we cannot remember ever to have seen anything that could fairly be called a pharyngeal tonsil at birth.

We have still to examine the under side of the skull of the infant. It is very flat, not only from the non-development of the face, but from the formation of the occipital region. The basilar process is nearly horizontal, and the small occipital condyles barely project. The greater prominence of the condyles, which is found later, goes with the more raised position of the head. The degree of this projection and also the shape of the condyles doubtless cause that particular poise of the head which is characteristic of each individual. There is a greater growth between the front of the condyle and the base of the skull in man than in woman, which explains why men and women hold their heads differently. Of course there must be every degree of difference in the development of these features, which, when slight, causes variations, and when extreme, is called anomalous. The reason for this remark, which may seem foreign to the subject, is that in a similar way the pharynx presents all kinds of variations from what may strictly be called the norm, and some of these variations of structure may have pathologic consequences.

The infant's larynx, minute as it seems, is said to be relatively large, but it is hard to believe that this detail should be of importance. It is worth noting, however, that it is relatively broader and more rounded in front. The top of the epiglottis is on a level with the lower part of the anterior arch of the atlas, and the lower border of the cricoid approaches that of the fourth cervical vertebra.

The changes of the pharynx during growth depend on two processes. The first and most important of these is the development of the face, which, as it enlarges, necessarily grows downward, carrying the hyoid and larynx with it. The other is the rising of the basilar process and the increased prominence of the condyles. Thus we may roughly picture to ourselves the naso-pharynx changing from a passage to a chamber by the front of the basilar process bending up behind, and the face descending in front. It, of course, is in intimate relation with the progress of the posterior nares. In the course of the first year the diameters of the posterior nares have doubled. but the proportions are about the same; that is each is slightly broader than high. After the second year the height increases more rapidly, but it takes till after puberty for the height to exceed the distance between the internal pterygoid plates. The line of the hard palate carried backward, which at birth was near the junction of the basi-occipital and the sphenoid, at three strikes about the middle of the former. At six it would touch the front of the foramen magnum, which is about the adult condition. In the meantime the back of the septum has become more vertical and the naso-pharynx even at three approaches its definite shape. During this time, however, what has been gained in space is endangered by the growth of the adenoid tissue of this region. After the completion of the first dentition the skull loses the infantile aspect and assumes that of the child, which much more resembles that of the adult. The face still is small; but after puberty there is a marked advance toward the condition of perfect development which is at its highest in middle life.

The descent of the larynx is a very interesting process, concerning which many more observations are to be wished for. The influence of the position of the neck must be taken carefully into account, and we need to know more precisely than we do the limits of individual variation, which is certainly considerable. While we may say that the position which we call the normal one is reached by puberty we do not feel justified in giving the levels for the intervening years. Just what this normal position may be is also a question that is not yet closed. Frozen sections have brought into general acceptance the view which places the lower border of the larynx at the top of the 7th cervical vertebra, or at least near it, but a very interesting monograph by Mehnert* has proved rather disquieting. His results are obtained from observations on the living, and he believes that during life and in the upright position the larynx lies deeper by one vertebra then after death. If this be true there is no discrepancy, for in the prime of life he places it at the top of the 1st thoracic vertebra. His work has been so carefully done that we do not like to question it; but to one who is not an expert the identification of individual cervical vertebrae in the living is very difficult for more reasons than one. Mehnert shows moreover that the larynx, and indeed the respiratory apparatus as a whole, continues to descend during life. He believes that in old age the larynx may (in the living) reach the lower edge of the 3d thoracic vertebra. This descent is retarded or even interrupted between thirty and sixty, but is none the less progressive during life. In the latter half it is associated with changes in the spine, with increasing girth and weight of the abdominal organs, together with impaired elasticity and tonicity. In early life the descent is a phenomenon in the course of development; in the latter half it is the result of degenerative changes.

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*Ueber topographische Altersveränderungen des Atmungsapparatus, Jena, 1901.

LVII.

THE PATHOLOGY AND DIAGNOSIS OF OTITIS MEDIA INSIDIOSA, i. e., SCLEROSIS; WITH REMARKS ON THE TREATMENT.

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In the last ten years considerable progress has been achieved in microscopic research into the diseases of the ear. Our knowledge of pathology has been enhanced more especially through the improved methods of decalcifying, embedding and staining microscopic sections. In the middle of the last century but little definite knowledge existed of the histo-pathologic states of the finer structures of the labyrinth, and the diagnosis and treatment of ear diseases was dependent largely upon macroscopic and clinical observation. The first pathologic condition of the stapes was demonstrated by the anatomist Morgagni, who discovered that a bony deposit caused a complete fixation of the stapes. The clinicians of that early period regarded ankylosis of the stapes as the cause of progressive deafness and considered it to be incurable. Later writers attributed this form of progressive deafness to some lesion of the acusticus, and the designation of "nervous deafness" was introduced. The gradual development of laboratory research and the methods of making functional examination enabled aurists of the last century to diagnose ear diseases and class them, broadly, into affections of the sound-perception and the sound-conduction apparatus. The Toynbee collection of specimens and the labors of Politzer, Moos, von Troeltch and many others, revealed the fact that the majority of diseases of the ear reside in the sound-conducting channel, and many cases of the nervous deafness of the older writers were classed with middle ear disease. Within the last ten years new light was furnished through laboratory and clinical research of Politzer, Katz, Bezold and Siebenmann on the pathology of the disease variously known as sclerosis of the middle ear, dry middle ear catarrh, chronic progressive deafness and otitis media insidiosa.

The term sclerosis was selected by von Troeltsch on clinical grounds, having for its anatomic basis only that the mucous membrane of the tympanum and the ear drum appeared sclerotic. It was held that an interstitial inflammation of the mucous membrane of the tympanic cavity initiated this sclerosis, which by extension involved the chain of ossicles, the oval and round windows. The rigid and dense condition of the membranes was regarded as obstructive to the transmission of sound waves The disease presented clinically a high degree of deafness with pervious Eustachian canals and normal tympanic membranes. The new findings revealed that the lesions consist not so much of sclerotic conditions of the membrane and ossicles, but rather of a hyperplasia of the bony elements of the capsule of the labyrinth. This osseous process may localize itself to affect simultaneously the cochlea and the ossicular chain, and may also extend to the semicircular canal. The osseous change begins primarily within the bone, independent of middle ear disease, and is allied to that form of disease first described by Politzer as primary capsulitis labyrinthi. This author discovered this pathologic change by autopsy on subjects of advanced age.

Other investigators affirm what Politzer suspected—namely, that capsulitis labyrinthi may begin at an early age and progress slowly to complete fixation of the stapes in the adult. A place of predilection for this osseous formation exists wherever there are deposited cartilaginous elements, as in the compact bone of the capsule, the posterior half of the oval window, at the point of articulation with the stapes, the upper and the lower wall of the cochlea and in any of the semi-circular canals. The most frequent localization is in that part of the ear that is most active—namely, the articulation of the stapes with the oval window.

When confined to the labyrinth this hyperplasia may by its exostoses, much like a neoplasm, affect the integrity of the acusticus in a mechanical way, and induce the symptoms of nervous deafness.

Its localization in the ossicular chain causes either partial or complete fixation, or dislocation of the stapes.

In two out of the twenty autopsies that have thus far been made, was revealed a simultaneous involvement of the sound-perceiving and the sound-conducting apparatus. Siebenmann first demonstrated this combination in the semi-circular canal, the cochlea and the ossicles, the case, in vivo, presenting the clinical picture of nervous deafness. The functional test showed diminished bone conduction. Vertigo without vomiting (necessitating lying down) was exhibited by the patient, being an evidence of involvement of the semi-circular canal. The acusticus was found to be without a lesion. The stapes was partially ossified and dislocated as shown in Fig. 7.

PATHOLOGY.

The osseous process may be divided into two stages, the first of which consists in an active proliferation of all the cellular elements within the bone. New vascular and cellular tissue is formed in the narrow spaces and in the Haversian canals. Among the new formed bone cells may be found giant cells, under the influence of which the basement of the bone substance is principally absorbed. Hollow spaces are formed, and areas of erosion gradually undermine the originally compact bone, which becomes traversed by irregular and abnormal channels. Simultaneous to the absorptive process there is formation and apposition of new bone, but which is unlike the original, being more voluminous and porous. The second stage is ushered in when the progressive changes cease and when the new bone assumes a lamellar structure. Then the abnormally large and thick bone corpuscles are found concentrically arranged, and the nucleus of these later undergoes atrophy. The vascular system is likewise gradually altered by the formation of connective tissue, in which at times may be found fat-cells. The Haversian canals and spaces have been changed in structure by this resorptive and appositional process, and all the cartilaginous elements have been metamorphosed into osseous tissue, as it cannot be found in the new growth. Thus the process constitutes not only a hyperplasia and hyperostosis, but also a metaplasia.

The new structure differs from the normal by its affinity and greater absorptive power of carmine stains, which fact is utilized in the differential diagnosis. The microscopic evidences of this new formation are the osteophytes, situated usually near the stapes articulation. Frequently the stapes is partially absorbed by penetrating blood-vessels and replaced by osseous formations. Sometimes a dislocation of the stapes is produced by an encroachment of the osteophytes. The function of the oval and round window may also be seriously interfered with by the hyperostosis producing partial or complete occlusion. When the process invades the tip of the cochlea, the patency of the Eustachian tube is threatened. Its lumen is narrowed by thickening of the periosteum, as was demonstrated by the microscope. Owing to the great vascularity which attends especially the first stage of this process, it is probable that the distressing tinnitus of progressive deafness may have its origin in the increased capillary circulation.

The structural alteration consequent upon an invasion of this bone-formation into the cochlea and the semicircular canal, may permit a change in the pressure and the density of the labyrinth fluid. The mechanical and physical qualities of the endo- and peri-lymph may be so altered as to interfere with the nutrition of the parts and induce disease. The detonating sounds heard by some patients and the complex of symptoms of Meniere may be ascribed to a perforation of the septum, dividing the endo- and the peri-lymph systems.

While the histologic alterations were found to be identical by different authorities, yet their designation of the bone-hyperplasia differs and new synonymous terms are consequently introduced. Politzer defines it as capsulitis labyrinthi or oto-sclerosis. Siebenmann, noting the resemblance to sponge by its rarefied spaces and porous structure, designated the new formation as spongification. Katz compares the process to Volkman's osteitis vascularis chronica. From personal observations of different specimens the oseous change appears to be identical with the rarefying osteitis of our text-books.

ETIOLOGY.

The etiologic views also differ. Siebenmann regards the disease as probably a resorptive or physiologic process of ossification of cartilaginous tissues fissue. He does not look upon it as an osteitis, but rather as a final developmental process, which normally does not take place in the temporal bone, though it is the rule in other bones. Bezold believes that the pure cases of sclerosis are not due to catarrhal diseases (although the two may co-exist).

The diatheses of inflammatory rheumatism. gout and scrofula are regarded as predisposing to this bone formation, also the diseases of the naso-pharynx, such as diseased tonsils and adenoids. The theory that a metamorphosis of cartilage into bone may induce the hyperplasia, is strengthened by the fact that Virchow admits the possibility of bone out of cartilage. It is highly probable that the calcareous deposits and other products of inflammation, such as synechia and adhesions may, by their irritation, incite this metamorphosis to activity. Sudden climatic changes and exposure to wet, likewise injuries, such as a fall from a horse, have been associated with the beginning of this disease. It has been frequently observed that the sclerosis is not always a progressive deafness; it may remain stationary and the individual have sufficient hearing-power for social or business intercourse. The microscopic records show that the nerves supplying the bone have always been normal—a fact which will contradict the theory that a trophoneurosis induces the bone disease. In most cases examined the membrane of the tympanum was found thickened, the result of the active hyperemia which accompanies this process; in its first stage, no evidence of round cell infiltration was found. But in very few cases was it discovered that the bone hyperplasia was the sequel to middle-ear suppuration. The search for bacteria as causative factors proved negative. Clinical observation and autopsy records affirm that capsulitis labyrinthi may begin at an early age, and that its duration may be from three to thirty years. The fact that more women than men are afflicted suggests that pelvic diseases may act predisposingly to progressive deafness. Seventeen per cent. are first affected with the disease at the time of the puerperium, this fact suggesting to several authorities the justifiability of committing an abortion in those subjects affected with progressive deafness, as a prophylactic procedure. Dr.

Blake has observed a hyperemia of the promontory in the region of the niche of the oval window in young women, occurring periodically with menstruation and in those subjects affected with erosion of the cervix, malposition of the uterus and other pelvic diseases. With the correction of the pelvic abnormality, the hyperemia disappeared and an improvement of the hearing followed. It is conceivable that a long continued congestion, reflexly induced by pelvic disease in the sensitive region of the niche of the oval window, may incite not only a connective tissue but also a bony hyperplasia. Statistics show that about 10 per cent. of all middle-ear diseases are true sclerosis, and this group according to new discoveries, results as a consequence of a bony or calcareous formation. The fact that the disease affects both ears uniformly, would lead to the conclusion that a constitutional diathesis plays a certain roll. The Toynbee collection of 1,100 pathologic specimens contained many that exhibited depositions of calcareous material, and since then the investigations have shown that the gouty diathesis is an important factor. Several cases were reported as occurring consecutive to inflammatory rheumatism, which revealed the identical pathologic changes of arthritis deformans, in the stapes articulation.

DIAGNOSIS.

The diagnosis of capsulitis labyrinthi is made by the exclusion of the other forms of progressive deafness, the objective signs, the subjective symptoms and the functional test with tuning forks. This group, then, may be recognized by the familiar signs of sclerosis, such as normal tympanic membrane (with perhaps diffuse or circumscribed opacity). The handle of the malleus may be slightly retracted, but is not rotated upon its axis. Now and then a red area is visible through the tympanic membrane, which is indicative of hyperemia in the region of the promontory, serving as strong corroborative evidence. Inspection of nose, pharynx and mouth of Eustachian tubes reveals normal conditions. The auscultation by catheter demonstrates that the Eustachian tubes are pervious, and the tympanic cavity unobstructed to air and free from secretion. The objective signs scarcely show a departure from normal conditions, and do not indicate the high degree of deafness which is usually present. This fact led an author to the facetious definition that sclerosis is a disease in which the physician sees nothing and the patient hears nothing. Fortunately, the subjective symptoms, the family history and the functional test with tuning forks are of great diagnostic value, enabling the careful aurist to recognize sclerosis, even in its early stage.

The subjective symptoms are high degree of deafness, usually of both ears and of insidious origin, more often between the ages of 20 and 35. Some acute pain and sensation of pressure and numbness around the head are felt. Persistent and distressing tinnitus, accompanied at times by detonating noises and some vertigo. Paracusis Willisi is nearly always present. Inheritance plays an important role in this group. In half of this group, some immediate member of the family is affected, seventeen per cent. originating at the puerperium.

It is important for diagnosis to eliminate all other forms of progressive deafness, such as arise from industrial pursuits; the constitutional anomalies, such as leukemia and hereditary syphilis, likewise the deafness following the acute and chronic infectious diseases; neoplasm of the tympanic cavity, and also the nervous diseases implicating the acusticus. The deafness of old age is also to be excluded, as it is not due to an osseous formation, but rather to an atrophy of the acusticus. Most important is the exclusion of catarrhal and suppurative diseases of the middle ear and the Eustachian tubes, since relatively the same functional test applies to them. The objective signs of the suppurative class, in contradistinction to sclerosis, are marked, except when co-existent. These are the retraction of the tympanic membrane, the handle of the malleus being rotated upon its axis, the evidences of former inflammation and suppuration, which may be adhesions, a cicatrix, a perforation of the drum-membrane, or calcareous deposits. The inability of the tympanic membrane, as seen with the otoscope, also the history of the patient and the absence of paracusis Willisi. These factors, together with an improvement of the hearing upon inflation, will aid in the differential diagnosis.

FUNCTIONAL TEST.

By the functional examination with the tuning-fork, we are enabled to measure the intensity and duration of a given tone. Through two avenues, by air and bone, may be discovered diseases of either the sound-conduction or the sound-perception apparatus. It will be remembered that the human ear is capable of perceiving a note as low as twelve vibrations per second, but the average normal low-tone limit is C_2, the equivalent of sixteen vibrations per second, while the highest note heard by the normal ear is g^8, or the equivalent of about 50,000 vibrations, comprising in all eleven octaves of tone. Experiments prove that the chain of ossicles and drum-membrane are requisite for the conveyance of the lower tones, the higher notes finding more ready ingress through the bone-channel. Through the agency of antagonistic forces, the sound-conducting apparatus, that is, the tympanic membrane and chain of ossicles, is held in a state of perfect equilibrium. This is accomplished by the musculus tensor tympani, the stapedius and the muscular fibres of the tympanic membrane, which, together, prevent excessive tension and relaxation. In consequence, the sound-waves are conveyed more effectually through the æreo-tympanic channel than the osseo-tympanic channel. A disturbance of this exquisite state of tension—as by closure of the eustachian tubes, by adhesive bands, by perforation of the drum-membrane, or an osseous or membranous formation causing fixation of the stapes—will result in an alteration of the normal sound-conduction. That of the bone may exceed that of the air-channel. The extent of such interference with the function of the sound-conducting apparatus may be determined with the aid of tuning-forks. There exists in all cases of rigidity or fixation of the ossicles a defect in the perception of the lower tones by air-conduction. This defect of perfection may range from one-half to one and a half octaves of the lower tones, depending upon the degree of deafness, while the bone-conduction is prolonged. The diseases of the cochlea, disturbing the sound-perception apparatus, are evidenced by the defective hearing of the high notes through air and by diminished bone conduction. The translations of the highest notes are supposed, according to the theory of Helmholtz, to take place in the lower region of the cochlea, in the narrowest portion of the basilar membrane. Hence, the locality and the extent of the disease may be estimated by the defect in the perception of high notes. With the aid of Schwabach's and Rinné's tests and the determination of the lower-tone limit, it may be ascertained whether or not fixation of the stapes exists. This can be almost positively shown by the Bezold triad test. These are, first, prolonged cranial bone conduction with an A fork; Rinné's test, shortened or negative, with a^1 fork; third, defect in perception of one-half to one and one-half octaves of lower tones. When the labyrinthian structure is exclusively invaded, the same test applied will react with almost opposite results. First, shortened cranial bone-conduction with a^1 or A fork; second, Rinné's test, positive or very little shortened; third, clear perception of nearly all the lower tones; fourth, defect in hearing the high tones. Thus, the same process may, according to the location, produce a bony ankylosis or nervous deafness, and may be diagnosed by the different tests. The accuracy of these tests cannot be questioned; diagnoses of stapes ankylosis and nervous deafness, made in vivo, have been sufficiently verified by autopsy examinations. In more than half of the cases the process was found localized on the vestibule side of the oval window, and affected the lower turn of the cochlea. The extent of the invasion of this part of the labyrinth may be determined by the defect in perception of the high tones. An extensive co-existence of the bone formation in the ossicles and labyrinth renders the differential diagnosis almost impossible. In that event, they may be classified as dysacusis. In this category also belong the one-sided deafness, where the normal ear of the opposite side interferes with the examination of bone-conduction, and all such cases where insufficient data are obtained, as from children and the weak-minded. The term sclerosis is suitable when applied to the sclerotic condition of the mucous membrane of the tympanum, the oval and round window, but is insufficient when an osseous formation exists, as the latter is an increase rather than a decrease of tissue. A more precise definition would be capsulitis labyrinthi, complicated by either stapes fixation or nervous deafness.

When a combination of both exists the case could be classified as simply deafness or dysacusis. The term spongification, introduced by Siebenmann, is as appropriate as capsulitis labyrinthi, but does not convey so precisely the point of origin.

TREATMENT.

The discovery that an osseous process, and not catarrhal disease, is the fundamental cause of sclerosis gives direction to our therapeutic efforts. The mechanical, the surgical and the medicinal treatment of sclerosis have been faithfully tried, but with unsatisfactory results.

The medicinal treatment of sclerosis, with a view of causing removal of the materies morbi obstructing the ossicles by the internal use of absorbents, such as iodin, mercury and phosphorus, has given only negative results. The most promising has been the use of phosphorus in small doses, administered for periods of six months during the year. The thyroid extract was given with some satisfactory results in the early stages of the disease, due probably to the absorption of the granular tissue, which precedes the osseous formation. An early diagnosis of progressive deafness in subjects predisposed by heredity will permit proper hygienic and medical treatment. The use of large doses of potassium iodid has been found efficacious in the hands of Politzer. The administration of potassium iodid should be continued for a period of three months, or longer, during the year. In cases where the rheumatic diathesis is a causative factor the use of solvents for uric acid is indicated.

MECHANICAL TREATMENT.

This consists of mobilization of the chain of ossicles, which, if not excessive, may temporarily benefit the hearing. This is brought about principally by transudation of serum, following massage, which facilitates the movement of the articulation of the ossicles. The effect of excessive pneumo-massage by the use of rarefacteurs is exerted principally upon the posterior segment of the tympanic membrane, the fibres of which become weakened, resulting in relaxation of the drum membrane. The condition induces not only increased tinnitus, but also a decrease in the hearing power. Pneumo-massage should be given only for one-half to one minute, twice or three times per week for one or two months. The patient should be advised to return after a period of two months for another course of pneumo-massage. Dr. Blake emphasized the necessity of gentleness in the use of the rarefacteur, as it is apt to provoke a misplacement in the whole chain of ossicles, more particularly a relaxation of the posterior segment of the drum head. When this condition exists, Dr. Blake resorts to an application of collodion to the relaxed portion of the tympanic membrane with the view of contracting the parts and thus restoring equilibrium.

Surgical measures, such as stapedectomy, excision of oval window and other procedures, have proven of temporary benefit only. It was found that the trauma of the operation induces a migration of plastic material, which later organizes into a cicatrix and frequently renders the condition for hearing worse. Equally ineffective has been the local treatment, by forcing irritating substances, such as iodin, silver and solvent solutions, into the tympanic cavity. It has been condemned on the theory that the irritation produced an increased periosteal cell proliferation, an exception to this being when catarrhal disease and sclerosis co-exist. A prophylactic procedure is the removal of diseased tonsils in the pharynx and vault, upon the theory that suppurative processes induced primarily by the diseased tonsils are frequently followed by deposits of calcareous matter, which in later life may initiate ossification of cartilage in those subjects predisposed by heredity to capsulitis labyrinthi.

It is doubtful if the osseous hyperplasia of advanced sclerosis can be removed by any agent now at our command. The cell-stimulating and absorbent effects of the X-ray and the violet ray upon lupus and inoperable malignant tumors have led the writer to institute experiments with these agents in cases of sclerosis and chronic otitis media.

SUMMARY.

1. Sclerosis is fundamentally a hyperplasia of the bony capsule of the labyrinth; the hyperplasia is a transforma-

tion of cartilage into bone, i. e., metaplasia, accompanied by formation of outgrowth of bone, i. e., hyperostosis.

2. It is initiated by constitutional diathesis, such as inflammatory rheumatism, gout, syphilis and scrofula, by diseased tonsils in the pharynx and vault, suppurations with calcareous deposits in the tympanic cavity, exposure to cold and wet and injury.

3. Its localization is usually in the labyrinth capsule near the stapes articulation with the oval window, inducing fixation of the ossicles.

4. It may involve also the semi-circular canals and cochlea, to produce symptoms of nervous deafness.

5. It may affect simultaneously the sound conduction and the sound perception apparatus.

6. The functional test, the subjective symptoms and family history permit an early diagnosis of this disease. These are:

1. Hyperemia of promontory.
2. Heredity.
3. Schwabach test reveals prolonged bone conduction.
4. Rinne's test is negative in varying degree.
5. Defective perception of one-half to one and one-half octaves of the low tones.

7. Probably ten per cent. of the middle ear diseases are true sclerosis and are designated synonymously capsulitis labyrinthi, oto-sclerosis, spongification, dry middle ear catarrh and otitis media insidiosa. The therapy is effective in early stages of the disease by hygienic and medicinal treatment. The more advanced cases may be improved by judicious treatment, with amelioration of tinnitus.

27 East Adams Avenue.

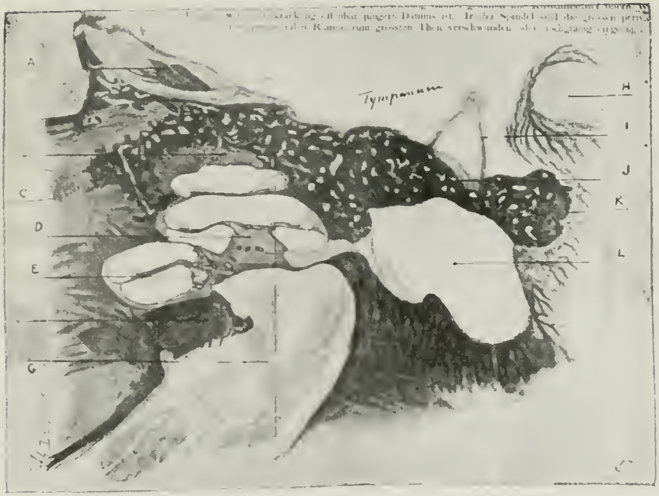


Fig. 1.—Horizontal section through the labyrinth in the region of stapes and upper portion of cochlea.—Siebenmann.

A—Tensor tympani.
B—Capsule of cochlea.
C—Normal bone.
D—Central axis of cochlea.
E—Ganglionic canal.
F—Hyperplasia of bone.
G—Acusticus.
H—Facial nerve.
I—Stapes (ankylosed).
J—Stapes, foot plate (ankylosed).
K—Hyperplastic bone.
L—Vestibule.

Patient was a physician 46 years old. Deafness in both ears at his 20th year. Father and two brothers deaf. No history of otitis media. Some vertigo and tinnitus.

Diagnosis in vivo: Nervous deafness.

Watch heard 1 cm. on right side.
Watch " " " " " by pressing only.
Watch " through bone clearly from all points.

Microscopic Finding:

Hyperplasia of capsule of labyrinth with exostoses in pelvis ovalis. Bony fixation of stapes on vestibular side. Hyperplasia of the cochlea, capsule, with proliferation of the perineural and perivascular connective tissue in the lower basal turn of the cochlea.

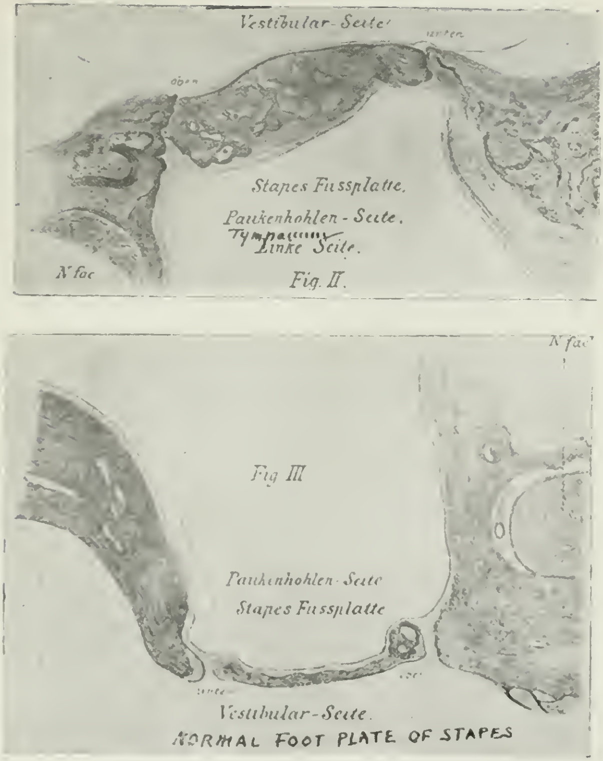


Fig. 2. Vertical section through foot plate of stapes (Bezold).

Male 24 years old, deaf in both ears since 17th year. Brother and sister likewise deaf.

Diagnosis in vivo: Sclerosis.

The functional examination revealed the following:
Schwabach's test, A fork, prolonged 19 seconds.
Rinné " a′ fork negative { R. 9 " / L. 10 "
Lower tone limit { R. c. 64 V. / L. F. 85 V.
Whisper { R. 6 cm. / L. 25 cm.

Microscopic Finding:

Hyperplasia of bone of foot plate of stapes. Ankylosis of stapes. labyrinth and tympanic cavity are normal. Fig. iii shows normal size of foot plate for comparison with Fig. ii, which is five times enlarged by the osseous formation.

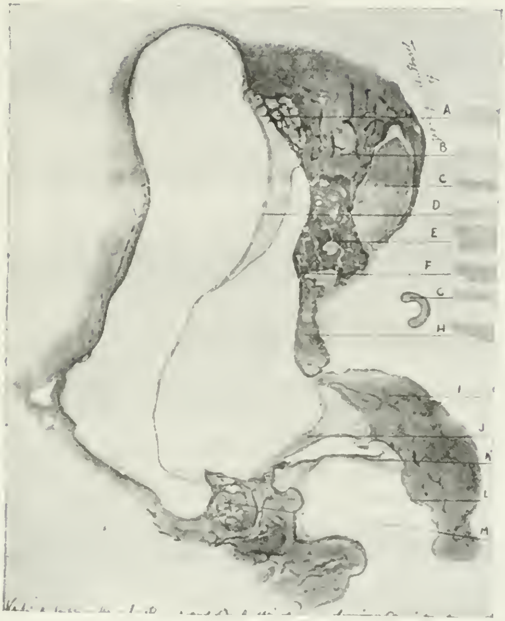


Fig. 3. A vertical section through the round and the oval window. —Siebenmann.

A—Utriculo-ampullaris nerve.
B—Normal bone.
C—Facial nerve.
D—Macula utriculii.
E—Hyperplasia of bone.
F—Ankylosis of stapes.
G—Caput stapedis.
H—Thickened foot plate of stape.
I—Promontory.
J—Lamina spiralis.
K—Tympanic membrane second.
L—Niche of round window.
M—Ampullaris posterior nerve.

Patient was 60 years old, totally deaf on both sides; began during exposure in war at age of 25 years. Functional examination was not made. Hyperplasia of the capsule of the labyrinth involving the stapes with incomplete ankylosis. The upper margin of the oval window has a bony union, whereas the lower margin is free. The plate of stapes is much thickened.

LVIII.

NOTES ON THE RADICAL MASTOID OPERATION.

By Chevalier Jackson, M. D.,

PITTSBURG, PA.

Otologists are approaching an agreement that: When, in the absence of mastoid symptoms, suppuration has continued three or more months after ossiculectomy followed by wick treatment, the radical tympano-mastoid exenteration is indicated not only for the cure of the discharge, but to put the patient's life out of jeopardy.

The dissensionists from this view are growing fewer every year. Their only worthy contentions are these two: first, hearing may be adversely affected and, second, the discharge is not always cured. These contentions are based on failures. An analysis of the causes of failure leads the writer to class them under the following heads:

1. Failure to remove all diseased tissue.
2. Neglect of after-treatment.
3. The combination of a closed retro-auricular wound with a small meatal aperture.

Failure to remove all diseased tissue is due to losing sight of the object of the operation and confusing it with the object in acute mastoiditis. The operator's first cases are apt to be acute ones. He opens a thin cortex, gingerly curettes out an abscess in communication with the antrum, inserts a gauze drain, which is renewed every day or two, and in a couple of months the case is well. This is bad surgery in even the acute case, but the worst effect is that the surgeon is apt afterward to attack a chronic case in the same careless way, and certain failure results. The experienced surgeon knows that the radical operation must have purely a pathologic basis. Every carious spot must be followed until nothing but healthy, as well as smooth, bony or other tissue walls the cavity on every side.

In making the Stacke meatal flaps, the surgeon hesitates to encroach upon the concha, and the result is too small an opening for efficient after-treatment, especially where exuberant granulations tend to run riot. Körner's flaps yield a capacious opening, and a cure of the discharge may always be looked for if all disease has been thoroughly eradicated. But the Körner's flaps, or any other meatal flaps, if they are cut far enough into the concha to leave an adequate opening for efficient after-treatment, leave a gaping meatus that amounts to a deformity. This deformity is sometimes quite obtrusive as compared to a depressed scar, or even a permanent opening post-auricularly. This is, of course, of most importance in the case of women, who would rather have a hideous scar or opening back of the ear, where it can be hidden, than the slightest noticeable departure from the normal in a natural feature like the concha. They are apt to have the poet's "pink shell" as an ideal. Another drawback to this mutilation of the concha is the occasional occurrence of perichondritis of the pinna, with its resultant atrophy and disfigurement. A case of very great deformity occurred in the writer's practice, where infection occurred by the patient tearing off the dressings while intoxicated. The shrivelled auricle is pointed to as a "Jackson ear." All the deformity is attributed, not to the patient's intoxication, but to the lack of skill on my part. Any attempt to get along without a large meatal aperture, with conchal incision, will result in troublesome after-treatment and a certain percentage of failures to stop the discharge. It will be a battle against exuberant granulation, pus pockets, stenosis, crusts, scales, dermatitis, and relapse, if it be a case of cholesteatoma.

All these considerations drift the writer's preference toward letting the meatus and concha alone and healing up the retro-auricular wound from the bottom, allowing it to close (or closing it) only after the entire wound cavity, including the antrum, is filled and covered in with a thick layer of firm, fibrous connective tissue, obliterating everything except the newly enlarged and sloped tympanic cavity. This cavity is covered, not with true skin, but with cornified mucous membrane, such as in cases cured by ossiculectomy, and it is situated at the fundus of the normal external auditory canal. That to this is due the ex-

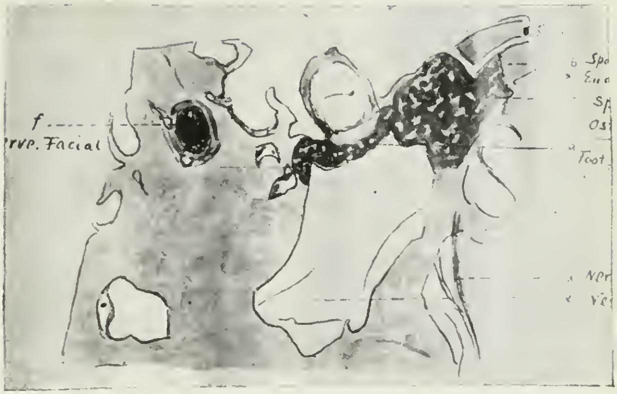


Fig. 4. Horizontal section through ankylosed stapes and hyperplastic bone of the capsule of labyrinth.—Katz.

a—Foot plate of stapes.
b—Hyperplasia of bone reaching to endorsteum of cochlea.
c—Hyperplastic bone involving the foot plate of stapes, causing complete ankylosis.
d—Vestibular nerve.
e—Vestibule.
f—Facial nerve.

The above specimen was obtained from a woman of 39 years of age, who was very deaf, suffering from tinnitus. She had never had otitis media, but had been affected with rheumatism. Family history and functional test were unobtainable.

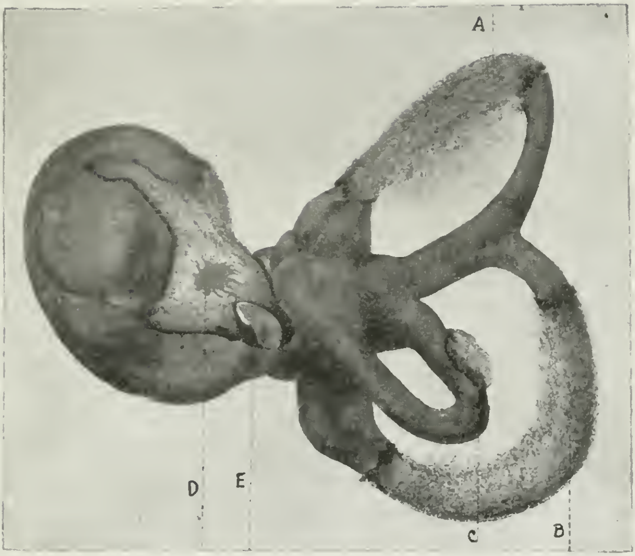


Fig. 5. Hyperplasia of semicircular canal and cochlea.—Siebenmann.

A—Superior semicircular canal.
B—Posterior " "
C—Lateral " "
D and E—Ankylosis of stapes.

cellent hearing retained in his later cases, the writer is certain, though no opportunities for microscopic examination of the conditions about the foot plate of the stapes and the oval window have occurred.

If the meatal flap method be abandoned, some other way of hastening the healing must be adopted. The plan followed by the writer is shown in the cut. The object sought is to obtain large, thick skin flaps which shall not only furnish epidermis, but, by their bulk, shall help fill the large cavity. The line AB, Fig. 1, represents the original incision, which is made a centimeter or more back of the attachment of the auricle. This leaves a margin between the auricle and the wound, which, being drawn forward (along with the auricle) during the operation, afterward slides backward so as to partially overhang the crater-like wound cavity in the bone shown by the dark shading in the sketch. This overhang is formed into one or two flaps (C D) by paralleling the original incision with another close to the auricular attachment, as shown by the dotted line, and supplementing this by a cross cut. If only one flap is desired, the cross cut is high up at the upper margin of the bone cavity; if two flaps are preferred, the cross cut is at the middle of the bone cavity. If the upper wall of the bony wound is abrupt, one flap is preferable, and is tamponed into the floor of the wound. If the upper wall is sloping, the cross cut is made on a level with the centre of the bone excavation. The two flaps are tamponned tightly against the bone (Fig. 2), where they attach themselves, helping to fill the cavity by their bulk and furnishing a source for prompt epidermal extension. The original incision, AB, should not be so far back that the flaps are likely to contain hair follicles, nor so far forward as to

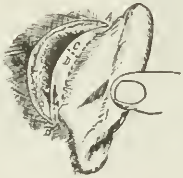


Fig 1

Dotted Lines Locate Flap Incisions.

enter the cartilage. A very narrow flap is sufficient in some cases only two millimetres wide, though from one to two centimetres is better if the cavity be large. In some cases the first incision was so far back that the posterior flap did not require elevation or retraction. It is not necessary that the flaps shall be so extensive as to cover all the granulating surface. To furnish large nuclei for the spread of epidermis is really sufficient. Ordinarily the epidermis must extend inward from the skin edge of the wound; if we lay in a flap, be it ever so narrow, it furnishes a greatly increased edge for extension. Still, the broader the flap, the quicker the completion of healing. It might be supposed that the hastening of the epidermal extension would make the resultant scar deeper, because of the completion of epidermization before there has been much filling in from the bottom by fibrous connective tissue. Clinically, however, we find this is not the case, as shown in Fig. 3. In some cases the skin flap was cut and turned in at the time of operation, but in other cases it was deemed better to wait until the bone was covered with small, firm, healthy granulations before making the flaps by incising, as shown by the dotted line. Then, the under surface of the flaps also presented a healthy granulating surface, which was always found to have adhered to the bone on removal of the tampon two days later. The depth of the wound beyond the ends of the flaps (which, by the tamponade, must be kept widely away from each other) rapidly fills with connective tissue, which is covered by epidermis extending from the free ends and edges of the flaps.

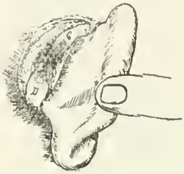


Fig 2

Flaps in Position.

In the method of operation here advocated, if there has been no previous ossiculectomy, the membrana tympani and ossicles or their remnants are removed through the

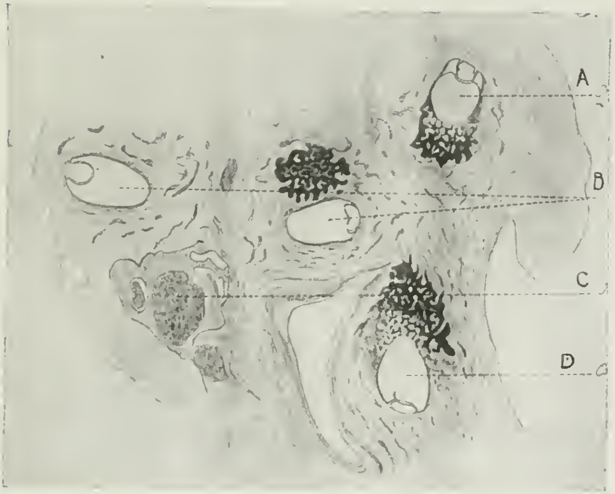


Fig. 6. Hyperplasia of semicircular canals, showing areas of retraction.—Siebenmann.

A—Posterior canal.
B—Lateral "
C—Facial nerve.
D—Posterior canal.

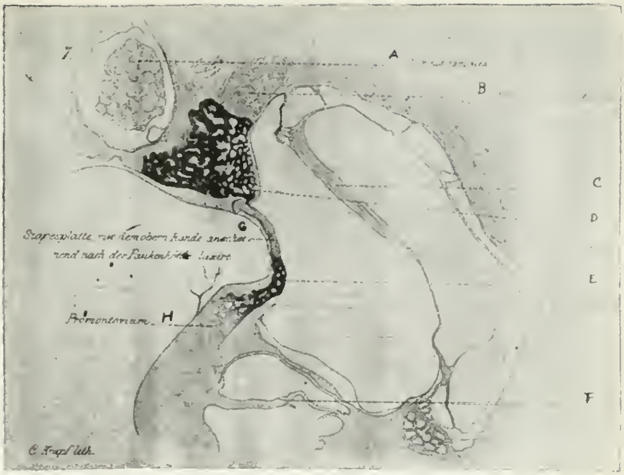

7
A
B
C
D
E
F
G
Stapesplatte mit dem obern Rande ankylosirend nach der Paukenhöhle luxirt
Promontorium
H
C. Angst lith.

Fig. 7. Hyperplasia in the region of oval window and stapes articulation.—Siebenmann.

A—Facial nerve.

B—Utriculo-ampullaris nerve.

C—Macula utriculi.

D—Upper portion of oval window, showing hyperplasia of bone with slight exostosis into the vestibule.

E—Hyperplasia of bone causing ankylosis of foot plate of stapes.

F—Tympanic membrane second.

G—Base of the stapes dislocated toward the tympanic cavity.

H—Promontory.

Figs. 5, 6 and 7 represent sections obtained from one subject in whom the hyperplasia affected simultaneously the stapes, the cochlea and the three semicircular canals. The case was a woman aged 52, who had been deaf for five years. Father had also been deaf, She suffered from vertigo without vomiting and pain in ears. Tympanic cavity, drum membrane normal.

Diagnosis in vivo: Progressive nervous deafness.

Schwabach test shortened 10 seconds.

Rinné test, positive 25 seconds.

Whisper $\begin{cases} \text{R. 4 cm.} \\ \text{L. 150 cm.} \end{cases}$

Lower tone limit could not be determined owing to impending death.

Microscopic finding: Hyperplasia of bony capsule of the three semicircular canals and cochlea, involving the foot plate of stapes. Formation of exostosis on vestibular and tympanic surface of the oval window, causing dislocation of the stapes on one side, while the other shows evidences of commencing ossification of the cartilaginous covering of the stapes.

meatus as the first step. The entire posterior wall of the bony meatus is removed, except so much at the inner end as is necessary to avoid risk of injury to the facial nerve. In sclerosed mastoids this wall is removed with the chisel in driving an entry into the antrum. In pneumatic or necrotic mastoids, with cortices of no abnormal thickness, the antrum is entered first and the posterior meatus wall removed rapidly with the rongeur. The mastoid cells, antrum and tympanum are converted into one continuous cavity, but the membranous meatus is neither split nor excised. A notch is punched from it with Myles' ethmoid forceps to insure a free passage between the wound cavity and the tympanum in the early stages of the healing. Leaving plenty of space here lessens the likelihood of cicatricial bands about the oval window, binding down the stapes—especially likely to happen in petrous necrosis, involving the margin of the oval window. The mastoid cells are obliterated, whether diseased or not, and the outer attic wall is removed, and the whole bony cavity is rendered smooth and even free from disease. The cortex should be cut away (after the antrum is entered) as widely as possible, so as to make the most gradual possible slope into the antrum, with the largest possible external orifice. On this the flaps and the extending epidermis rapidly make a smooth, sloping "skin" surface, sinking toward the dimple in the centre. Of course, if the bony wound were very small, like that made by a drill, the flap or flaps might interfere with drainage, and exuberant granulations might be troublesome; but such an opening is not contemplated in a tympano-mastoid extenteration. It is the filling in of a large cavity in the bone with which we are concerned. The plan here recommended for rapid healing must not be combined with the Stacke or other operations that involve the slitting or excision of the membranous canal, as this would result in a permanent opening behind the auricle, a condition rarely called for. There is no need of extirpating the membranous meatus, as in the Schwartze operation, nor of withdrawing and then replacing it, as in the Stacke operation. It is usually sound, healthy tissue, and from its posterior surface healthy granulations spring. In the writer's method it forms the anterior wall of the post-auricular wound, the healing of which it hastens by lessening the size of the cavity to be filled by flaps and granulations.

The statement is often made by operators that their Stacke or Schwartze-Stacke operations are well in from three to six weeks. The writer must confess to the inferiority of his results. At the end of this time the meatal flaps are attached, but he has never seen a Stacke or Schwartze-Stacke case that was completely epidermized and dry, so that it could be safely discharged from all oversight short of three months, and he knows of one very competent otologist who is still working at a case operated thirteen months ago. By the writer's method healing has been secured in one case in seven weeks, in another two months. The average duration was ten weeks and the longest four months. The half-tone engraving is from a photograph of a case that healed in two months after a complete tympano-mastoid exenteration. The patient, a woman of 45 years, had otorrhea since scarlatina in childhood. Intra-tympanic syringing, dry treatment, wick treatment and ossiculectomy, bettered, but did not cure. There were no mastoid symptoms. Operation was consented to on the promise of probable cure. Eburnation had obliterated all the pneumatic spaces except the antrum, which was small, filled with pus and granulations, and its walls were carious. The posterior superior wall of the bony meatus had been chiseled away in driving an entry into the antrum. All diseased tissue was removed; two skin flaps by the writer's method were made at once. The healing was unusually prompt, the discharge has never returned. The photograph taken some months after the healing shows the smooth, even, dimpled scar.

The writer has been asked why he removes the posterior bony meatal wall if no meatal flaps are contemplated. The removal is to facilitate the ablation of the outer attic wall and the inspection and cleansing of the attic, as he does not believe these can be efficiently accomplished with the outer wall of the aditus in place. The necrotic remnant of the incus, which has escaped the ossiculectomy is occasionally a gratifying find in this part of the operation. Rarely both incus and malleus will have to be removed in this way on account of stenosis of the canal.

The writer's conclusions may be epitomized as follows:

1. When in the absence of mastoid symptoms, suppuration has continued three or more months after ossiculectomy followed by wick treatment, the radical tympanomastoid exenteration is indicated not only for the cure of the discharge, but to put the patient's life out of jeopardy.

2. The only worthy objections to this rule are two: Hearing is occasionally adversely affected, and the discharge is not invariably cured. These objections are based on failures.

3. Failures are due chiefly to three causes:
   a. Failure to remove all diseased tissue.
   b. Neglect of after treatment.
   c. The combination of a closed retro-auricular wound with a small meatal aperture.

4. An adequate meatal aperture can only be secured in the Stacke, Körner, Pansa and similar operations by extending the flap incisions far out into the concha. A better method is Körner's. Either method will leave a gaping meatus amounting to deformity.

5. Any attempt to get along without a deformedly enlarged meatus will result in troublesome after treatment and an occasional failure, especially in cholesteatoma.

6. A large posterior scar, even a permanent retro-auricular opening, can be hidden easily in women, and even in men is far less obtrusive than even the slightest deformity of a natural feature like the concha. Occasionally perichondritis is the result of local infection, or constitutional dyscrasia may result.

7. For the foregoing and other reasons, it is better to let the concha and cartilaginous meatus alone and to heal up the retro-auricular wound from the bottom, allowing it to close, or closing it, only after the entire wound cavity including the antrum is filled and covered in with a thick layer of firm fibrous connective tissue, obliterating everything except the newly enlarged and sloped tympanic cavity. This cavity is covered not with true skin but with cornified mucous membrane, such as in cases cured by ossiculectomy, and it is situated at the fundus of a normal external auditory canal. It is the writer's opinion that this accounts for the bettered audition in his latter cases.

8. The most satisfactory operation in the writer's experience may be summarized as follows:

a. Removal of the membrana tympani and ossicles through the meatus.

b. A curved incision, a centimetre or more behind the auricle, so that when released from the retractor after the bone ablation, the post-auricular skin will overhang the bony wound cavity. The incision commences just back of the temporal artery to allow ample retraction of auricular flap forward and downward.

c. Ablation of mastoid and removal of the posterior osseous meatus wall in the usual way, with the widest possible wound diameter at the cortex.

d. Another incision close to the auricle, the tissue between this and the original incision forming, when divided over the centre of the bone cavity, two tongue-like flaps, one hanging down from above, the other projecting upward from its attachment below. These are then tamponed into the wound against the upper and lower walls respectively. These skin flaps may be made either at the original operation or a week or two later after healthy granulations have covered the bone and the under surface of the flap. In the latter case the deeper portion of the bony wound is plugged with gauze to prevent its being filled with blood. After bleeding has been checked with hot sponging, the packing is removed and the wound is sponged dry and repacked, the outer portion of the packing being formed into a firm cone that is firmly pressed into the wound by a roll of gauze and a tight bandage. The flaps will be found attached at the next dressing, forty-eight hours later. When it is preferred to make the flaps at the original operation, as in cases free from petrous or intracranial involvement, and surely cleaned out, it is a great advantage to have carefully elevated the periosteum (if healthy) with the anterior flap—not to have it scraped away in shreds as is often done. In some cases, however, this will make too thick a flap; in such it may be necessary to clip away the under surface of the flaps to make them taper down to nothing at their inner extremity. If the upper wall of the bony wound be chiseled abruptly inward from the cortical surface, without any slope, as is often done, it is necessary to make but one flap. This is done by making the cross cut at the top of

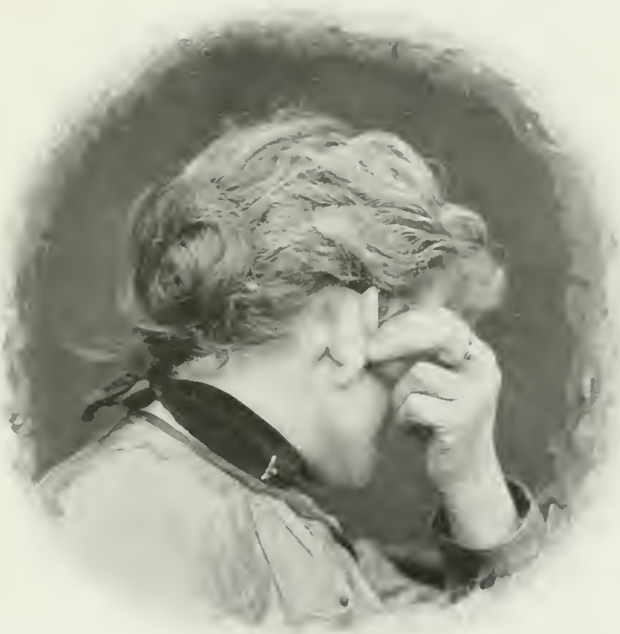


Fig. 3.

the bony wound, leaving a long tongue-like flap to be turned in on the floor of the wound.

A motor-driven burr, as advocated by Macewen, is undoubtedly the best tool for leaving a smooth surface upon which granulation buds and pathologic spots are quickly discernible, and which is followed by rapid and smooth healing; but the motor-burr in addition to its slowness, has two almost insurmountable objections, its bulk and weight limit, its use to one particular operating room; and its hand piece and shaft are practically unsterilizable after they have been spattered and bedaubed with blood and pus. To put them into a steam sterilizer is to ruin them, and gaseous formaldehyde sterilization is inconvenient and unreliable, unless preceeded by a thorough mechanical cleansing with soap and water, which would very soon ruin both shaft and hand piece. Of course no one questions the thoroughness of Macewen's technic, but to be certain of asepsis with any shaft and hand piece yet obtainable, requires personal care and supervision, while chisel and mallet will always be placed before him, rendered unquestionably aseptic by the regular routine. In some other respects the gouge and chisel are open to criticism, especially the forms in use. The carpenter uses a chisel mostly for making a square cornered hole called a mortise. For him a square cornered chisel is a necessity. The mastoid operator never desires a square hole and to him the square chisel corners are an objection. The gouge has no corners, but it leaves a groove in the bone. Any operator who will try the round cornered chisel with rounded basil. shown in Fig. 4, will probably abandon the sharp cornered chisel altogether and will use the gouge

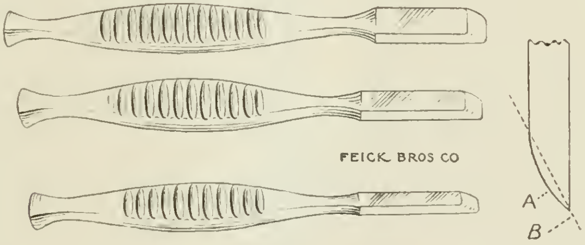
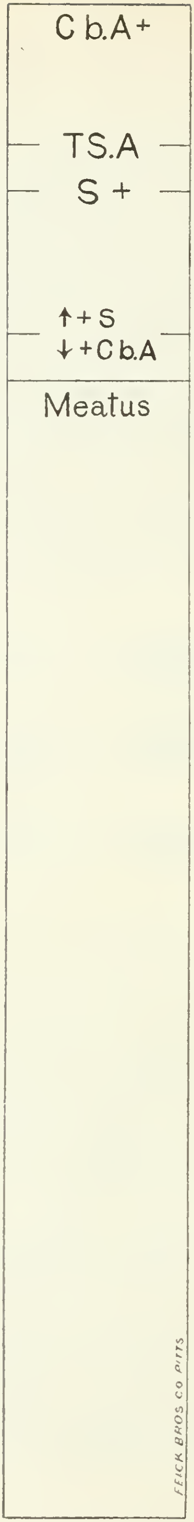


Fig. 4. Round Cornered Chisel with Rounded Basil.



Fig, 5. Otologists Rule for Reed's Line.

very little. It does not leave a groove like the gouge. It flakes off the bone as smoothly and much more rapidly than the rotary burr. It differs from Lucae's chisel which has a flat basil, angular corners, an edge the arc of a circle, and it leaves a groove in the bone. The writer's chisel has rounded basil, rounded corners, a straight edge, and it leaves a flat, smooth track. The foregoing is intended to apply especially to the opening of eburnated mastoids. For the thin cortex usually encountered in acute mastoiditis almost anything will do. It will be found better than any instrument in use for flaking off the outer layer of bruised, infiltrated and dirt-ingrained bone in skull injury cases, as it does not leave a groove nor does it have sharp corners. The form of its basil enables the surgeon to run the shaving out thicker or thinner at will, the depth and length of cut being under perfect control, the result being always a smooth track tapering off at the surface to nothing in every direction. General surgeons who have tried it all commend it.

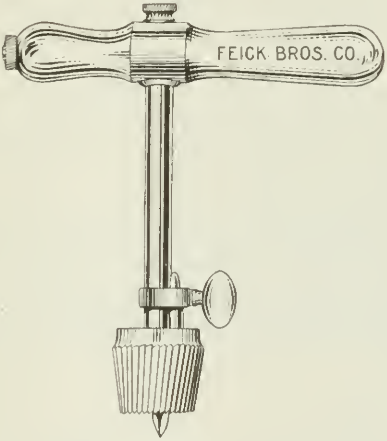


Fig. 6. Aseptable Trephine with Ratchet Handle.

The trephine, shown in Fig. 5, will be found to have an advantage over the forms in use on account of its simplicity, rapidity of cutting and ease of cleaning. It can be taken completely apart, and it has no uncleanable hollow shank or hollow handle. The point, sliding in an outside guide, can be moved to-and-fro as easily as in the dirty, old fashioned instrument that belongs to a by-gone age. The ratchet will seem awkward to surgeons who are used to the old to-and-fro motion. For such the ratchet can be locked. But driving the crown continuously in one direction by the ratchet greatly increases the rapidity of the cutting, and tends to throw the sawdust up the lateral grooves and out. In some of the intracranial cases encountered by the otologist, rapidity of cutting is a great necessity. Rapidity in cutting does not endanger the dura more than slowness. It simply requires shorter intervals between examinations of the cut.

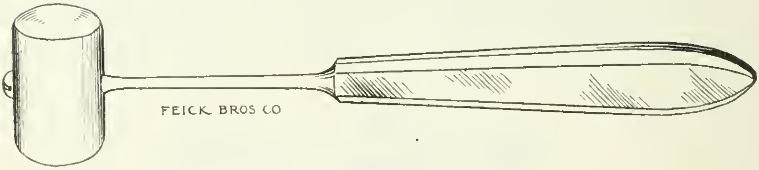


Fig. 7. Mallet for Mastoid Work.

The rule (Fig. 6) for laying off points from Reed's base line will be found convenient, as it has only points of otologic interest, namely, trephining points of election for temporo-sphenoidal abscess, cerebellar abscess and the lateral sinus.

LIX.

SIMPLE ULCERATION OF THE VOCAL CORDS, WITH REPORT OF CASES.*

By Wendell C. Phillips, M. D.,

NEW YORK CITY.

A careful study during the period of about twelve years of a private patient suffering apparently from occasional attacks of simple catarrhal ulceration of the vocal cords, has been of such interest to me as to make it seem worth while to present his history for the consideration of the members of the section. The patient, Mr. B——, first came under my treatment in 1891, having been referred to me by his family physician, who thought there might be a commencement of some serious disease of the larynx. Mr. B—— is a splendidly developed and apparently a perfect specimen of humanity, with no bad habits and no history of any organic disease. His family history was good, excepting that an older brother died from tubercular disease. He uses tobacco and alcohol in great moderation. At that time he was suffering with dysphonia to a slight degree and very slight hoarseness. There was no cough and but little expectoration. This condition seemed to have resulted from taking cold. There was no rhinitis, but there was a large septal spur. His naso-pharynx and pharynx were slightly congested; his temperature was normal. Laryngeal examination revealed what appeared to be a moderately large nodule, located about the junction of the middle and posterior thirds of the right vocal cords, about over the processus vocalis, a small surface of which was denuded of membrane, presenting all the appearances of a small ulcer about one-fifth of an inch in diameter. From this ulcer bloodvessels could be seen radiating in every direction. Aside from a very slight amount of infiltration about the edges of the ulcer there was no infiltration anywhere in the larynx. The arytenoids were perfectly normal in appearance and there was no epithelial hypertrophy or wart-like looking eminences in the posterior commissure.

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*Read before the Section of Laryngology and Rhinology of the N. Y. Academy of Medicine, April 23, 1902.

The ulceration was very superficial in character, apparently involving only the mucous membrane. There was no loss of voice, but some slight interference with the resonance. The subglottic space was nearly normal. There was almost no secretion. The mobility of the cords was not interfered with. The treatment at that time consisted of applications of nitrate of silver to the ulcerated surface, the administration of small doses of iodid of pottash and, so far as possible, rest from talking. This treatment was carried out for two or three weeks with some improvement, when he was called upon to take a trip South, to be gone about three weeks. Upon his return the ulceration had entirely disappeared, but there still remained a small nodule, which later on disappeared altogether. At this time I removed the septal spur, hoping that its removal might result in no further attacks. This, however, did not prove to be the case, as since that time he has passed through a similar experience four times. The treatment during these attacks has been the same each time and as soon as possible I have sent him upon a trip usually to Bermuda (by boat) and he has returned entirely well. In no instance have I been able to determine definitely any specific cause. They have never seemed to me to be due to taking cold, and with the exception of the last attack, over-using or straining of the voice, could not have been the cause. The last attack came on in November, 1901, the day after election. For three weeks previously he had been using his voice steadily in making political speeches, both in and out of doors. It came on suddenly and with the usual history, except that it was more severe than the former attacks and both cords became involved, each having a good sized nodule, which broke down and ulcerated. His recovery was slow and only became complete after a trip to Bermuda.

This case has been very interesting to me and I have come to believe that the cause must be laid to climatic influences, as I can account for this condition in no other way. To be sure his last attack might be due to overstrain, but it only differed from the others in that it was more severe, and it is quite probable that the severity of the attack only may be attributed to voice strain. I have not had time to go over the literature of this subject, but a glance at a few books has led me to think that but little has been written upon it.

Bosworth states (Diseases of the Nose and Throat, in his Chapter upon Chronic Laryngitis, Vol. 2, page 521): "When these small bloodvessels arrange themselves in the form of a small circle, it is liable to present the appearance of a minute erosion or ulceration, thus encouraging a somewhat prevalent impression that an erosion may occur in a chronic laryngitis." The cords are slightly swollen and present certain irregularities, not only on the surface, but on the edges, the result of a somewhat irregular epithelial proliferation. This is apt to be most marked in their posterior portion and especially in the neighborhood of the vocal processes of the arytenoid cartilages. He further says: "I have never in a single instance seen any condition in the larynx in this disease which warranted the assertion that there was sufficient denudation of the mucous membrane to constitute a genuine erosion."

Kyle, Diseases of the Nose and Throat, says: "During the course of simple chronic laryngitis, superficial ulcerations may take place, or more likely localized spots of desquamation may appear, most commonly between the arytenoid cartilages. The ulcers, however, may involve deeper structures, followed by organized granulation tissue or trachoma."

I have already remarked that the ulceration in my patient has always been exceedingly superficial, the edges of the ulcer not being much elevated and almost no burrowing underneath, but that the mucous membrane was destroyed there was no doubt.

I am indebted to Dr. Joseph A. Kenefick for brief histories of the following two cases, both seemingly similar to my own.

CASE I.

(Dr. J. A. K.) In the White Mountains, 1890, had a severe attack of influenza, which involved the whole respiratory tract, causing complete aphonia. Resolution of the inflamed cords took place very slowly, leaving, eventually, a chronic laryngitis with ulcers over both processi vocales. These refused to heal during the early following winter, and he was finally compelled to leave Boston and go to Lakewood. After a month at Lakewood he returned to Boston, much improved, and, under special treatment, the ulcers finally healed in March.

For four years he was extremely sensitive to vitiated atmosphere, smoke, cinders and dust of all kinds, and could not sing or exert the vocal apparatus without feeling distress in consequence.

CASE II.

Mr. W. M. I—— came under treatment in December, 1899, complaining of pain, fatigue and distress after the exertion incident to teaching a large Bible class on Sunday afternoons. This task involved about one hour's steady talking. Of late the distress was so marked as to make it necessary to consult a specialist.

He is 65 years of age, his history negative, except that he is troubled with occasional attacks of gouty eczema marginalis, which always yields to appropriate treatment. He has never been strong physically.

Examination shows slight redness of the left vocal cord, with a brighter line of redness along the free border of the cord running from the anterior commissure to the body of the arytenoid, with a shallow ulcer about the size of an ordinary pinhead just over the tip of the vocal process. There was no marked induration of the surrounding tissues and no glandular swelling.

In consultation with Dr. Lefferts, he made the diagnosis of simple catarrhal ulceration of the vocal cords and advised treatment by fine sprays of strong solution of zinc sulphate. After two weeks' treatment, with improvement, the patient was seized with an attack of influenza which greatly taxed his strength, confining him to bed for six weeks, during which the larynx ulceration healed over without further treatment. In April the larynx showed complete healing.

LX.

TREATMENT OF PRINCIPAL DEFECTS OF SPEECH.

James Moreau Brown, M. D.,

CHICAGO.

It is not my purpose at this time to treat extensively of the defects of speech, but simply to give a clear differentiation and the most rational treatment of the more frequent conditions—stammering and stuttering.

Some authors regard stammering and stuttering as implying the same thing Others strongly insist upon the necessity of distinguishing one from the other as implying two different conditions. McCormac, perhaps the earliest writer upon these conditions, defines stammering as hesitation of speech and stuttering as stoppage of speech, the proximate cause being, in most cases, an effort to utter words or other vocal sound when the air in the lungs is exhausted and they are in a state of collapse or nearly so.

Behnke, a later writer, defines stammering as a defect in the utterance of consonants and stuttering as a defect in utterance of vowels. To illustrate this he states that if the stammerer wishes to say "pa" he has a kind of lockjaw and cannot get his consonant out; this, however, once accomplished he has no trouble in adding the vowel to the consonant. He may be equally confused in trying to utter a word commencing with a vowel and in spite of a widely opened mouth no sound will be forthcoming. If a stutterer wants to say "pa" the case is exactly reversed; he has no difficulty in articulating the consonant "p"—his difficulty consisting in adding the vowel to it.

It is a general notion that a child will outgrow the impediments of speech, and in some instances the difficulty does decrease as the mature age is reached. The child learns speech by imitation and many defects of speech may be obviated by early training. Talking to children in the so-called "baby-talk" should in all instances be discouraged.

The treatment of stammering and stuttering is by no means easy. A system has to be employed where, perhaps, the entire mode of life must be changed to say nothing of the continuous training which is to be carefully taken, slight mistakes often causing a complete setback. The treatments, for the sake of convenience, may be divided under three headings:

Pathologic Aspect.—It is the opinion of many that stammering and stuttering may be successfully treated by the training of breath and speech alone. This is, however, erroneous as in the majority or cases it is first necessary to remedy any defects of the upper air passages, and frequently we find conditions due to a great extent to nervous affections. The speech difficulty may be a mere symptom of some grave nervous disorders which should have careful attention.

Mental Aspect.—It is a well-known fact that people afflicted with defects of speech, when in the presence of intimate friends and surroundings, such as to make them feel at ease, have complete control over the powers of speech, which shows that the underlying cause is mental and not physical. An excellent and amusing illustration of this is given by Kussman of Strassburg.

A woman was subject to sudden attacks of speechlessness, which occurred at intervals and lasted some time; during these attacks she was unable to articulate. Many forms of treatment had been resorted to without success. Finally, she was directed to mutter under her breath, at the commencement of every attack, the following words: "In the name of God, the Father. the Son and Holy Ghost," then turn around and expectorate, repeating at the same time, inaudibly, "that is for thee," while thinking of the devil. This remedy invariably stopped the attack.

Other mental causes of stammering, together with timidity and shyness, are distrust, fear of ridicule, eagerness, impatience, excitement, envy and imitation.

Elocutionary Aspect.—This is, perhaps, the most important, and the subject of correct breathing and training is to be considered under this head. In a majority of cases the speech difficulty can be traced fundamentally to the management of the breath. and the results obtained by training a patient to manage his voice by means of diaphragmatic action are marvellous.

As an illustration of this, a patient presents himself stammering very badly; when trying to say the alphabet he can scarcely pronounce a single letter, and in endeavoring to reply to questions the whole body is thrown into contortions. Control of the diaphragm is obtained and a short inspiration taken before each letter by contracting the diaphragm and pronouncing the letter by relaxation. These movements can be controlled by placing the hand upon the abdomen and it is wonderful to observe the results obtained.

The question naturally arises why diaphragmatic breathing should have such a beneficial influence on the voice. In reply to this we may state that clavicular breathing is unyielding and clumsy, owing to the bony structure of the upper part of the thorax and over which it is impossible to get easy and delicate control. The diaphragm, on the other hand, exercises muscular force on that portion of the chest walls which is surrounded only by soft and yielding parts and which can be trained to act with certainty and precision, the diaphragm being the great muscle of inspiration and expiration.

Conversation for a time should be avoided as much as possible and during respiration slowness and equability should be adhered to. The lips and tongue should be placed in position and air expired with force, pronouncing one letter at a time, then two, and later sentences as the training develops itself.

It is a common fault with stammerers and stutterers to try to speak with either widely extended lungs, or empty lungs, either of which is fatal to easy and smooth delivery, and to obviate this habit it is necessary to train the patient to breathe more lightly and more frequently. Breathing exercises not only give a more upright carriage to the body, but tend to develop the chest and keep the blood in active circulation. While they may not themselves effect a cure for stammering and stuttering they nevertheless are the most important aids in the work. Phonation drill of the pharynx depends upon the action of the adductors, or closing muscles of the vocal cords. If these did not act no phonation of tone would be possible, and if they act with uncertainty it naturally follows that the voice will be produced with uncertainty. Control over the soft palate also confers the invaluable power of breathing through the nostrils while speaking and singing, thereby preventing dryness of throat of which so many complain.

The time necessary for the treatment of stammering and stuttering will vary. Long-contined discipline of self-control is necessary—more so in children than in adults, who are able to comprehend the importance of and continue the treatment alone.

The above described methods of treatment are based upon observations published by Henry McCormac in 1828 and personal observation in the speech defect clinic of Dr. G. Hudson Makuen of Philadelphia.

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LXI.

REMOVAL OF METALLIC FOREIGN BODIES IN THE ESOPHAGUS BY THE AID OF X-RAYS.

S. E. ALLEN, M. D.

CINCINNATI, OHIO.

Anyone who has tried by means of forceps, coin-catchers, or other devices to remove the various metallic trinkets, such as cents, toy whistles, jack stones, etc., which children are so apt to put into their mouths, and which sometimes find their way and lodge in the esophagus, knows what a difficult task it is. It is impossible to feel the foreign body with the instrument with any certainty, and the whole effort at removal becomes the veriest plunging around in the dark. In fact our efforts resemble very much those of the old-time general practitioner in his attempts at the removal of foreign bodies in the auditory canal, possibly with as painful results.

Then, the diagnosis of the condition is always doubtful, and if nothing is removed one is always at a loss as to whether the foreign body remaines lodged or has been pushed on. Since I have had access to a good x-ray apparatus these foreign bodies present a surgical problem of the simplest sort.

The following short histories of three cases will serve to show the difficulty and danger of attempting removal in the old way and the simplicity and success of the new:

CASE I. Child two years old, brought to me with the statement of mother that it had been playing with pebbles and had swallowed one. This had occurred six days before, and since that time the child had been unable to take solid food, although milk was swallowed, but with much difficulty. X-ray examination showed the presence of what looked like a four-cornered jack-stone, lying in the neck, just below the larynx. The child was sent to the hospital, and under chloroform efforts were made to remove the same. While the obstruction could be made out on passing a small esophageal bougie, with neither forceps, hooks, nor other instruments could the jack-stone be caught. The efforts at removal only served to wedge it in more tightly, recalling very forcibly those blundering attempts at extraction of foreign bodies in the auditory canal. The case was referred to the surgeon and an external opening made into the esophagus and the jack removed. The subsequent healing was slow and, when complete, an esophageal stricture developed which it was impossible to overcome and the child died a month or so after the operation.

CASE II. Child 4 years old: history of having swallowed a cent four days previously, and since then was unable to take solid food. X-ray examination revealed the cent lying across the neck below the larynx. The child was kept in position before the tube and an assistant looking through the fluoroscope retained the coin in view, while I passed into the esophagus an ordinary laryngeal forceps, one with the blades opening in the plane of the forceps. It was of course easily seen by the assistant, who directed the course of the instrument. "You are down too far;" "draw up a little;" "a little further back;" "now up a little;" "a little further back;" "now open forceps;" "there go right down;" "now you have it." The instrument was then withdrawn with the cent. All done in a few moments, with no laceration and very little struggling of the child.

CASE III. Boy 5 years old, with a history of having swallowed a round, flat, tin whistle six days before, and since then inability to swallow anything but a little water. X-ray examination disclosed the object in the same position as the cent in case II. The child was kept in position, and an assistant taking the fluoroscope, the same forceps was placed in the esophagus and under similar directions the whistle was grasped and removed. This case was not in the office 10 minutes.

These cases have taught me that foreign bodies swallowed by children lodge just below the larynx, where the esophagus narrows as it descends to the stomach. While these bodies cannot be seen by examination with the mirror nor felt with the finger, a laryngeal forceps is plenty long enough to grasp them, in fact the great tendency is to go too far down. Under the X-ray these objects appear to be just above the notch of the sternum, and one feels a long forceps to be necessary to get hold of them, but this is not the case. They are just out of reach of the finger and within easy reach of such a forceps. In these two cases it was impossible for me to feel the foreign body and I had to rely entirely on the statement of the man behind the fluoroscope. Owing to the position of these narrow circular bodies it was necessary to view the neck from the side so that the assistant could direct antero-posteriorly as well as up and down, and be at the same time out of the way of the operator. These two children held very well and the operation should present no difficulty on account of the struggling tendency of children. The forceps must be introduced gently and nothing fastened or pulled upon until the assistant sees the forceps close over the foreign body and there will be little or no pain produced, and no lacerating or other damage done. The diagnosis and removal of these bodies is so very easy and satisfactory that I rather long for more cases of a similar character.

LXII.

A CASE OF EXOPHTHALMOS FOLLOWING MASTOIDITIS.

By Secord H. Large, M. D.,

CLEVELAND, OHIO.

So much has been written lately about mastoiditis and its complications that I feel a little backward in citing a case that came under my care a few weeks ago.

Mr. C., age 35, was referred to me, suffering from nasal polypi. Both nostrils were completely blocked, and he said he had not breathed through his nostrils in three years. I removed, in all, forty in six sittings.

As a routine practice, I examined his ears and found the canals filled with cerumen. This was washed out, first using hydrogen peroxid, then hot water, and some cotton inserted. He was told to keep a little cotton in his ears for a couple of days.

Next day he came to the office and forgot to insert the cotton and, as it was a very cold and windy day, he developed a very severe attack of otitis media. He was put to bed and given the regular treatment—calomel, one dose of opium and hot douches.

After twelve hours the pain still continued and, there being a very slight bulging, a very free paracentesis, under careful asepsis, was done. Quite a quantity of serum escaped; and a few hours later the pain had disappeared. Solution of boric acid was then instilled in the canal. Twelve hours after the paracentesis the discharge became purulent and on the third day he developed pain over the mastoid.

An ice-bag was applied, and in twelve hours the pain had entirely disappeared: not even on deep pressure was there any tenderness. The discharge was free, but was odorless. It was examined and found to be a streptococcal infection; a blood count was made and showed a leucocytosis of 14000.

The only unfavorable symptom was the temperature, which would run up to 102 and then recede. The pulse never went any higher than 96.

On the evening of the fifth day he was removed to Lakeside Hospital, so as to have him watched more closely.

The family were all opposed to any operative procedure.

Dr. Lincoln saw him with me on the sixth day and, as there was still no pain over the mastoid, no bulging of superior posterior quadrant, and as the temperature had dropped to 99.5, we decided he was on the mend. For the next few days he had no pain, the discharge was lessening, temperature never going any higher than 99.5 and, in fact he was feeling comfortable and wanted to leave the hospital.

On the twelfth night he became delirious, temperature went up to 104 and pulse to 96, and exophthalmos with diplopia developed in the left eye.

Drs. Allen and Lincoln saw him with me, and we decided to operate at once. We were not certain as to the cause of the exophthalmos—whether it was in the sphenoidal sinus, or temporo-sphenoid lobe, or between the meninges—but we made all preparations to make a thorough exploration.

With the assistance of Drs. Allen and Lincoln, I did a very extensive mastoid operation, and when the antrum was opened it was filled with offensive pus. All necrosed bone was removed and a free communication made with the middle ear, and search was made for any fistulous opening to the brain, but none could be found.

The next day after the operation the discharge had diminished considerably, the exopthalmos had entirely disappeared and temperature dropped to 99.5; pulse, 80.

The temperature and pulse, during the entire convalescence, never went any higher than the above. Two weeks later he was discharged, his hearing being normal, no discharge from middle ear, and the opening over the mastoid nearly closed.

Dr. Upson, of Conneaut, his family physician, then took charge of him, and to-day he is entirely well.

There are many interesting points about this case, the most important being the absence of pain over the mastoid.

Nearly all aural surgeons believe in placing an ice-bag over the mastoid for twelve to twenty-four hours and, if the pain is not relieved, to operate. In this case the pain disappeared entirely after the ice-bag had been on twelve hours.

Another important point was the exophthalmos, certainly caused by sympathetic pressure or absorption of toxins.

From the above case it would seem that there are no ironclad rules by which we are to be governed as to the time we should open the antrum. I myself think that the operation is not done soon enough, nor often enough. The operation is not dangerous, and the results are so gratifying that I think we are justified in making more exploratory openings into the antrum.

New England Building.

LXII.

REPORT OF A CASE OF ETHMOIDAL, FRONTAL SINUS AND ANTRAL EMPYEMA, WITH OPERATION ON ANTRUM AND MIDDLE TURBINATED BODY, FOLLOWED BY DEATH.

By George B. Rice, M. D.,

BOSTON, MASS.

Mr. B., aged 31 years, consulted me July 11, 1902, complaining of pain over the right eye and in the superior maxillary region on the right side, with obstruction to the nose and a discharge from this side, both anteriorly and post-nasally, having an offensive odor. This condition followed an influenza cold, contracted in the February preceding. The general health had become impaired, presumably partly by the trouble in the nose and partly by overwork. Two months previous to his consulting me a local physician had lanced the right side of the superior alveolar process. without finding pus or relieving pain.

Examination of the nose showed a much enlarged middle turbinated body undergoing polypoid degeneration. Percussion demonstrated pain in the supraorbital region extending into the nasal, lachrymal, and malar bones. Transillumination showed darkening of the right antrum, and pus could be seen exuding from beneath and above the middle turbinated body, both posteriorly and anteriorly. A trocar was pushed into the antrum through the outer wall of the nose, beneath the inferior turbinated body, and by suction a little pus withdrawn. It was however impossible to force any through the normal opening, because of the swelling and polypoid tissue about the middle turbinated body. A diagnosis was made of frontal, ethmoidal, and antral empyema, and it was thought wise first to free the normal opening of the antrum by removal of enough tissue from the middle turbinated body to permit of thorough irrigation of the cavity; to establish drainage of the antrum through the aveolar process; and after a reasonable time to curette the ethmoidal cells and open the frontal sinus externally. This plan was submitted to the patient and the patient's family physician for consideration. Two weeks later he came to my office for a second time and under cocain and eucain anesthesia, the anterior portion of the middle turbinated body and a quantity of polypoid tissue were removed by scissors and cold wire snare. Through the cavity of an extracted tooth the antrum was punctured and irrigated. Pus now came freely through the nose in large quantities, having so foul an odor that it was necessary to open the windows of the room. The antral cavity and the nose were thoroughly irrigated with a warm sterile, Dobell's solution, until the fluid returned clear from the nose and antrum, then a soft rubber drainage tube was put into the alveolar opening and the nose loosely packed with sterile gauze. The patient returned to his home in an adjoining town, and passed a fairly comfortable night. The following day he was seen by my assistant, Dr. E. R. Johnson, at his house. He then complained of pain in the right side of his face, and it was found that he had a temperature of 102, but on the whole he felt fairly well. The gauze from the nose was removed, the nose and antrum was irrigated as before, and a remedy was given for the headache.

On the 28th, Dr. Johnson saw him again. He still had a temperature of 102. Pulse 86. As the pain on the right side of the face continued, he was given an opiate in small, repeated doses, sufficient to relieve the pain.

On the 29th, Dr. Johnson found the temperature unchanged, and the pain apparently better, but he was inclined to drowsiness: the pupils, however, were equally dilated and responded quickly to light. The parts were cleansed as before, without apparent discomfort.

July 29th, I visited the patient with Dr. Johnson and found him with a pulse of 86, temperature 102-2/5. He was drowsy but could be aroused by using some effort. There was now an apparent loss of the use of the left arm, and he had occasional convulsive movements of all of the facial muscles. The face was flushed somewhat, and the family physician who had been in attendance, reported a small amount of albumen in the urine; he was taking his nourishment well; pulse and strength good. On the night of July 29th, the nurse reported a temperature of 104-4/5, but in the morning it had subsided to 102, with a good pulse of 84. The convulsive movement and coma continued. A neurologist was now consulted to learn, if possible, if the location of the brain pressure, or sepsis, could be determined, with a view to trephining, but as no definite conclusion could be reached, an operation was not attempted. No further symptoms developed, and the patient died on the morning of the first of August, six days after the operation. An autopsy was earnestly requested, but refused.

In thinking the case over, I am inclined to the belief that the patient died from sepsis, not directly from the antral empyema or the operation, but because there existed a frontal empyema and possibly sphenoidal empyema, which cavities were temporarily closed by the inflammation following the removal of the middle turbinated, and that a rupture of one of these cavities took place into the brain tissue. I am inclined to think that it would have been wise to have trephined the frontal sinus on the second day following the operation, although, of course, I could not be and am not now, positive that this cavity was the source of the brain infection. There was no external swelling, no pushing outward of the eye from pressure in the orbit, and no definite symptoms which could localize the infected point.

If any of the readers of the ANNALS has met with a similar case, I would esteem it a great favor if I could see a report of it.

LXIII.

MUCIN AND MALIGNANCY; FACTS AND THEORIES.

By Wm. Stuart-Low, F. R. C. S., England.

LONDON.

No substance in the human economy has been more despised and neglected of medical men than mucin, but it may yet be destined to become the head of the corner.

Mucus has ever been the butt and bete noire of the physician, whose every effort has always been strenuously put forth to brush, wash and dissolve it away as an evil thing, serving only to harbor organisms and retard and jeopardize recovery from pathologic conditions. How far wrong this depreciatory estimate of the value of mucin is, an attentive study of its nature, functions and probable ulterior destiny will amply bear out.

Mucin is the substance that gives the sliminess to mucus. It is very largely present in the system and is found under two conditions—first, almost universally distributed as the cementing material between cells—tissue mucin. This separates connective tissue cells and endothelial and epithelial cells even where most closely approximated. Normally there is always a layer, however thin, of muciginous material which separates the constituent cells in every tissue and membrane throughout the body; and, secondly, mucin is found on all mucous membranes, in mucous glands and in many epithelial and all special goblet cells—conspicuously so in the surface cells of the stomach wall, where every cell is mucus-secreting.

There are probably several mucins in the body. They are of a colloid nature, viscous, soluble in alkalies, but precipitable from such solutions by acetic acid. On boiling with dilute mineral acids they yield a substance which reduces Fehling's solution, and by appropriate processes mucin is broken up into a carbohydrate, called animal gum, and a nucleo-proteid. Mucin has been specially investigated in the jelly-like connective tissue of the vitreous humor, the Whartonian jelly and in tendons.

While the part that mucin plays is doubtless largely mechanical in lubricating and protecting mucous surfaces, its peculiar chemical constitution and behavior lend support to the belief that it has some further function.

Physiologists mostly agree that mucin is not broken up in the digestive process, but that it passes by the bowel unchanged. The very large amount secreted, however, and the comparatively small amount excreted would indicate that much is destroyed or absorbed in the small intestine, and the great additional supply in the large bowel supports this supposition; and further, nucleo-proteid, with its valuable percentage of phosphorus, being a result of mucin disintegration, the likelihood is that this is not thrown away, but is absorbed from the intestine for ulterior use in the economy.

Where mucin is found fulfilling chiefly a lubricating function, as in the gall-bladder and bile ducts, in the pancreatic duct and the lower bowel, it has a distinctly alkaline reaction and is mixed with the contents passing over the mucous surface. On surfaces bathed by the acid fluid, on the other hand, the mucin is diminished in alkalinity, and in this manner it is maintained on the surface proper for protective purposes; this is well seen in the case of the urinary passages, where much mucus is present and necessary. Such is a wise provision, for should the urine become alkaline the mucus present in it becomes then a serious factor in treatment. In the stomach again the acid gastric juice maintains the mucus on the surface, the protective function being paramount.

On the mucous membrane of the nose and other air passages the mucus plays a most invaluable part. It maintains moisture and conserves warmth, thus facilitating warmth, both common and special. It also keeps the membrane fit to catch foreign bodies (dust, bacteria, etc.) as the air filters through, and serves to secure such until the leucocytes can annihilate or remove them.

One of the most important actions of mucin, and one which has hitherto been altogether overlooked, is as a bactericide. This germicidal power was proved in researches which I had carried out two years ago in the Laboratory of Clinical Pathology, Queen Anne St. W., by Dr. G. L. Eastes. It was shown that mucin has a retarding influence on bacterial growth, that sterilized solutions containing mucin remained sterile for a long time on exposure to the air, and that bacteria ceased to grow in culture media when mixed with mucin. This is very interesting and instructive, and proves that Nature has, in the secretion poured out on mucous membranes, provided a ready means of suppressing bacterial growth. In the British Medical Journal of March 8th, last, there is an account (quoted from the Lyon Medicale) of a research by Prof. Fernand Arloing, in which this work is repeated. From this he concludes that the mucus of redsnails has a bactericidal action on the bacillus of Loeffler and other bacteria; and nasal mucus was found to be a bactericide for staphylococcus and pneumococcus, but not for coli bacteria nor for Eberth's microbes. It must be evident, therefore, that mucin fulfills a potent part in the defence of the body against bacterial attack.

The essential lesion of carcinoma is the penetration of cells into the surrounding tissues, but whether this new departure on the part of the cells is a result of a cellular change or of some alteration in the intercellular resisting substance is not yet clear. The probability is that there is a certain degree of both. In old age the inter-cellular material undergoes a wasting change, and as a result of this its resistive power against the ingrowth of epithelial cells is lessened, and thus the onset of carcinoma is favored, particularly as the overlying epithelium remains much longer active,and thus there is an influence inducing the cells to penetrate inward among the tissues. The centrosome in cells on epithelial mucous surfaces occupies that part of the cell nearest the surface, and therefore the part most exposed to injury and irritation. The centrosome is the dynamic center, and plays the leading part in the division of the nucleus, the proliferation of the cell, and the regulation of movement.

A study of the distribution of mucus manufacturing structures reveals the striking fact that where mucus is least abundant, there malignant disease is most located. This is the case where skin and mucous membranes meet at the edges of orifices, as at the lips, prepuce and anus; in the pharynx below the middle, as there are many fewer mucous glands in this situation than in the upper part; on the tonsil, where there are but few mucous glands or cells, even in the crypts. Malignant disease is common in the upper third of the esophagus where there are few mucous structures, and very common in the middle third, where there are practically none; it is least seen of any part in the lower third, where mucous glands are numerous. The esophagus is peculiar in being dependent almost entirely for its lubrication and protective coating on mucus passing down from above—from the nose and vault of the pharynx. I have observed a number of cases of malignant disease of the esophagus and in these there has been much diminution of mucous secretion from above shown by the deficient action of the mucous membranes of the nose and pharynx; and always, too, chronic dyspepsia, due to the same cause—too little mucous protective coating in the stomach. Malignant disease is most frequently situated in the stomach at the pyloric end, but although there is much mucus secretion here, there are special reasons for this selection; it is the most dependent part and most subjected to injury by lumpy and improperly masticated food, and constant irritation by the acid gastric juice; and from the fact that these patients are usually the subjects of deficient mucus supply from above—chronic hypomyxia nasopharyngia and hypomyxia gastrica—which account for the diminished mucous penetrative coating of the stomach.

Cancer is most seldom met with of any situation throughout the whole extent of mucous membranes, in the small intestine and in the lungs. As I have pointed out in previous writings (Mucin in Desiccation, Irritation and Ulceration of Mucous Membranes "Lancet," Oct. 12th, '91) there is more mucus poured into the small intestine than is to be found anywhere throughout the system; and the lungs have an abundant supply in the secretions of the lining membrane of trachea and bronchi. The inspired air is specially cleansed during its passage through the middle of the nose, the pharynx and larynx, so that if malignant disease is set up by irritants from without, there is small chance of such gaining access in any force into the lungs. The urinary tract again is wonderfully exempt from cancer, and mucus is plentiful on the surface lining. It is pathologically proverbial that malignant disease attacks and spreads in the mamma, but in this gland there is no mucus whatever, not even in the ducts. No protection is here necessary from irritating secretions, unless the milk were to become acid from the formation of lactic acid, and lubrication is not needed, as fat is the dominant element in milk. In the salivary glands how rarely is cancer encountered, but mucin is largely present in them and an element of their secretion—notably so in the submaxillary and sublingual. When malignant disease is met with in salivary glands, the parotid with its very meagre amount of mucus is much the most frequently attacked. The exemption of tendon and cartilage, and the frequency with which bone is affected, are also noteworthy. The mucous glands of the uterus are mostly found in the upper two-thirds of the organ, which is the least frequently affected by cancer, but I look upon a uterus prepared for carcinoma as an atrophic one, or becoming atrophic, just as atrophic rhinitis commonly follows on hypertrophic. The circumstances of frequent pregnancies is a strong predisposing cause. This is the hypertrophic stage in the case of the uterus, and it is at the menopause when the atrophy sets in that malignant disease comes on, as then there is a hypomyxatous condition set up.

During the last few months I have carefully observed fifteen cases of malignant disease, and have been struck by the fact that all have shown evidences of hypomyxia in varying degree. I am indebted to a scholary article by Dr. Walker Overend in the "Lancet" of March 30th, 1901, where he was kind enough to mention my former paper on mucin, for the nomenclature which here I have adopted. The term "orthomyxia" is used to express a perfectly sound and healthy state of the mucous membranes and their secretions. Quantitative change may be termed "metamyxia"—where the change is in excess the term "hypermyxia" is used, the converse condition would be "hypomyxia." Where there is a profound qualitative alteration then "paramyxia" would be most expressive.

Dr. Walker Overend also uses the term myxasthenia comparable to anemia and to neurasthenia, and I think quite rightly, because when the local hypomyxatous conditions have continued long enough, the state of myxasthenia is brought about.

In hypomyxia naso-pharyngia there is a history of the patient seldom or never using a handkerchief, never having occasion to blow anything from the nose, and there has in all seasons been a marked freedom from colds in the head. I have had cases where there has been irritation felt in the nose and frequent blowing induced, and still with hypomyxia present, but these have been instances of spur or deflection of the septum or other such condition. I have usually tested the hypomyxatous by requesting a trial blow of the nose into a clean cloth, nothing being expelled or at most a little watery fluid, but never the healthy mucus that can usually be readily extruded by the orthomyxatous, even when they happen to be octogenarians.

An inspection of the interior of the nose in such hypomyxatous patients shows a general loss of turgescence and vascularity of the mucous lining; it may even be distinctly dry and crusts may be detected. The turbinals are small and sometimes shrivelled, especially the inferior one, and this is most noticeable on both turbinals posteriorly, where most of the mucous secretion takes place. The cavity is more or less roomy. The fauces and pharynx display similar symptoms of lessened mucous discharge. Occasionally the posterior wall of the pharynx shows the paramyxatous change in form of streaks and tracks of altered mucus. This state of the naso-pharynx is often accompanied by a similar condition of the gullet and stomach, hypomyxia gastrica, with its attendant symptoms of dyspepsia and flatulency, and sometimes constipation; the constipation being due to a like alteration in the large bowel, hypomyxia colica, but this varies greatly in degree.

Now every one of the cases of malignant disease that I refer to and made note of were hypomyxatous to a varying extent; and as most of these were instances of the mucous membrane of the alimentary or upper respiratory track being affected, I am inclined to believe that there is a connection between the two states, and that the hypomyxatous is a fore-runner of the cancerous, especially in view of the fact that three-fourths of all cancer in man occurs in the alimentary canal.

Two features more I made out common to nearly all the fifteen cases of cancer—the first that they were nearly all much addicted to tobacco smoking, consuming from one to two ounces a day; and secondly were large salt eaters. Two of them were so addicted to salt eating that they even had it sprinkled on salt bacon. Both of these habits tend directly to bring about the hypomyxatous state. The hot tobacco smoke for a time stimulates the mucous glands, but soon causes desiccation and atrophy; and excess of common salt is pernicious because it precipitates and coagulates the mucin and causes an impairment of secretion.

The essential factor in cancer being intrinsic, a weakening of the intercellular resistance, so that the cells when proliferating can also penetrate into the intercellular spaces and substance, it may be that a myxastheniatous condition of the tissues favors if it does not cause their loss of resistance. Normally, as before remarked, there is always, even when reduced to a minimum, a layer of muciginous material between cells everywhere in the body, and it is possible that this is maintained in its natural tonic resisting state by an internal circulation of muciginous matter from the intestine to the tissues. If this be so a prolonged diminution of mucin in the alimentary tract would account for a deteriorative change upsetting the equilibrium between the cells and intercellular tissues.

With tissues thus prepared the effect of an injury or chronic irritation might be to determine such a morbid process as carcinoma or sarcoma, whereas in the healthy (orthomyxatous) these would induce no such changes, however long continued, but might only cause a harmless inflammatory action. This theory might also be made use of to explain why carcinoma is an affection of the decline of life, hypomyxia being a senile change.

I have lately been examining a number of very old people, mostly old men. I have found them all wonderfully orthomyxatous, having healthy naso-pharyngeal mucous membranes, good digestion, and regular bowel action. I am inclined to believe therefore that such is an insurance of healthy old age. I certainly have not yet seen one healthy old man who was not orthomyxatous, so that one is warranted in reckoning this as a condition favoring longevity. I recently examined a man aged 96 years who was sent from a workhouse to the Central Throat and Ear Hospital for slight deafness and tinnitus. He expressed himself as perfectly well in every way. His mucous membranes were in good condition and all to be made out was indrawing of the tympanum of both ears. I had no doubt that this was due to a senile change in the middle ear from desiccation of the mucous membrane, thus also accounting for the tinnitus. This was shown to be the case by the success of the treatment, viz, injection of warm mucin solution up the Eustachian tubes with markedly successful result, as his hearing improved at once, and the tinnitus abated and after a few injections disappeared. This man was a non-smoker and took very little common salt.

Hypomyxia is hereditary. The tendency, to a varying extent, of impairment of the mucus forming function is occasionally very evident in early life, and when so is almost always hereditary, either from one parent or both. This is most noticeable at special hospitals as rhinitis, pharyngitis sicca and atrophica, as early as from 5 to 7 years of age.

I have notes of two cases of sarcoma in the bones of children who were both quite hypomyxatous, as were both their parents before them. The question arises, does this explain the strange and unaccountable occurrence of sarcoma in early life, and of congenital sarcoma, hitherto a baffling problem?

In the following table of cases of cancer it will also be noted that in nearly every instance there was a history of syphilis. It is very remarkable how the stress of secondary syphilis mostly falls upon the mucous membrane. It is notable how many hypomyxatous patients have had syphilis. May this throw any light on the obscure but admited connection between syphilis and cancer?

Cancer has been shown to be much more frequent among civilized than among savage peoples, among the denizens of town than in rural population, and in fact, to dog the footsteps of civilization. This may be explained by the fact that much that is incident to town life is favorable to the development of hypomyxia. Foul and often dusty air and bad ventilation, especially in sleeping rooms, are some of the most noxious influences. Although cancer has been found to be commoner among town dwellers, any one with a hereditary hypomyxatous tendency, if in unfavorable surroundings, will readily become hypomyxatous no matter how rurally remote he may reside. The Boers might be cited as a people well known to be very liable to cancer, whose domestic sanitation is far from perfect, but is most emphatically bad as regards the ventilation of their sleeping apartments. The immunity of the lower animals from cancerous processes is still unaccounted for. Wild animals are very seldom affected and our domesticated animals but rarely. It is proved that the domesticated animals most subject to cancer are not as one might expect, the dirty feeding pig, but those cleanly and affectionate friends and companions of man, the cat and dog. They often share with man the same unhealthy surroundings, and this doubtless to some extent explains their liability. Another fact also helps to elucidate this obscure point, for the dog and cat possess much less provision for the formation of mucus than the horse, ox, sheep or pig. Their turbinated nasal structures are excessively convoluted to enhance the sense of smell, and so mucous secretion is a subordinate factor, little or no mucin being ever formed in an olfactory region unless in very small amounts. The feces of the dog indicate but sparse mucus supply all along the alimentary canal. The horse, ox, sheep and pig have quite an extraordinary development of mucin forming organs.

In the horse not only are both the anterior and posterior turbinated bones very well developed, but each bone has a special fibrocartilaginous framework extending to the external orifice of the nose.

These turbinated bones are essentially so disposed as to furnish the mucous membrane of the nose with a vast surface for mucus secretion, and the flexible appendages are even sometimes double. This free surface presents numerous glandular orifices and is constantly covered by an abundance of mucus that prevents desication. The upper one-third only of this larger area is devoted to olfaction.

Racemose mucous glands are specially numerous on the area of the septum and the cartilaginous appendages. Besides this extensive secretory region, solipeds have another special arrangement which also subserves mucus secretion; this consists of the socalled gutteral pouches—one on each side of the pharynx. They have, each, a length of four inches and a capacity of three-fourths of a pint. Their mucous lining is thick and vascular and very thickly studded with racemose mucous glands. Much mucus is secreted in these pouches and poured into the pharynx. Few mucous glands are present in the horse's esophagus, but it is well lubricated and protected by the copious supply from above, as all this mucus is swallowed, for the horse never has any discharge from the nose in health. Jacobson's organ is five inches long in the horse and very thickly packed with mucous glands. The ox has, also, a vast development of the turbinated bones, especially the posterior one and, besides, there is an extra turbinal—the third turbinated bone of the ox. The sinuses of the head, particularly the frontal sinuses, which are very extensively developed, open freely into the meatus and afford additional mucous secreting surface. In the pig there is also a large mucous secretion area and the turbinated bones are very prolonged.

The ox is constantly licking its muffle and thus swallowing the mucus escaping from the nose and removing the humid secretion with which it is always kept damp.

Chauveau, in his comparative analyses of the domesticated animals, gives the following table of the ratio of the area of the cranium to the face:

1 : 2.69 in the Horse.
1 : 3.43 " " Ox.
1 : 3.24 " " Pig.
1 : 1.17 " " Dog.
1 : 0.68 " " Cat.

Order: Cat, Dog, Horse, Pig, Ox.

The face area may fairly be taken as a very good index of the mucous supply area. It will be noted that this area is much the smaller in the *cat* and *dog*. The horse's secreting area is very much supplemented by the secretion in the gutteral pouches.

Name.	Occupation.	Disease.	Age.	Common Salt.	Tobacco.	Syphilis.	Hypoymxia.
Arthur R. Russel. Mans.,Oxford St. W.	A "bucker of horses," much indoors and in close rooms.	Malignant of rectum.	56	Taken an excessive amount over 40 years.	Smoked cigars, cigarettes and a pipe to excess.	Yes.	Has suffered from well-marked hypo-myxia Nasopharyngia. gastrica et colica for 30 years.
Jas. K., Faucitt Rd., Rotherhithe.	Laborer with the Nat. Telephone Co., much in dust at underground work.	Sarcoma of the tonsil.	30	Taken an excessive amt. all his life—a great meat and bacon eater.	An ounce a day for years.	Yes.	Well marked hypo-myxia, naso-pharyngia et gastrica et colica. and a rapid eater.
Mrs. R., Bury St., W.	House-wife, much indoors.	Malignant of the liver.	45	Always takes a good deal of salt.	No.	Yes,	Hypo-myxia naso-pharyngia moderately marked but gastrica et colica quite evident.
Thos. H., Kentish Town.	Worked many years in a very dusty sugar warehouse.	Sarcoma of the left side of the pharynx with a mass of glands in the neck.	69	Has consumed a very large amt. all his life.	At least one ounce a day for 50 years, often two.	Doubtful but was exposed to infection in his younger days.	Hypo - myxia naso - pharyngia very well marked, and also gastrica colica very evident.
Js. C., Walthamstow.	Cabinet maker, indoors work, and often very dusty.	Malignant of pharynx and parotid region.	51	Has always taken a very large amt.	One ounce a day but often got thro' one lb. a week.	Yes.	Hypo-myxia naso-pharyngia et gastrica et colica very evident.
Mrs. K., Albany Rd., E. C.	Housewife.	Malignant of omentum.	45	Has always taken a good deal of salt and has had a ravenous appetite for shell fish.	No	Doubtful.	Hypo - myxia noso - pharyngia slightly, but gastrica et colica evident.
Sidney L., Pimlico.	Piano polisher; indoor work and often very dusty.	Malignant of the esophagus.	65	Has always taken a large amt. of salt.	Smokes over one pound a week.	Yes.	Hypo - myxia, naso - pharyngia and gastrica et colica very well marked.

Wm. B., City,	Indoor messenger.	Malignant of the esophagus.	68	Very large consumer of salt all his life.	Smokes very large quantity.	Doubtful.	Hypo-myxia, N. P. well marked, and gastrica et colica.
Edwin B., West Ham.	Carman of the Midland Railway, often in foul dust.	Epithelioma, glosso-epiglottic region.	59	Very large amt. all his life. Put it on salt bacon.	One ounce a day.	Yes	Hypo-myxia N. P. et gastrica et colica very well marked.
Wm. M., Edinbro'.	News-agent (dusty indoors work).	Malignant lympho-sarcoma of cervical glands.		Had always been fond of salt with his food.	Half an ounce a day at least.	Doubtful.	Hypo-myxia naso-pharyngia et gastrica well marked.
Jas J., Dulwich Rd., S. E	Hair-dresser, in city, under-ground and dusty.	Epithelioma with enlargement of glands in the neck.	71	Taken salt in large quantities for 50 years.	Over an oz. a day, often more for all his working life.	Yes.	Hypo-myxia naso-pharyngia et gastrica et colica very well marked.
Chas. W., Kentish Town.	Engineer, indoors, worked in iron dust.	Malignant of the esophagus.		Taken salt with all his food in large amt. all his life.	Over one oz. a day.	Yes.	Hypo-myxia in nose and throat and stomach well marked.
Mary B., Pimlico.	Housewife, "always indoors."	Epithelioma of the tongue.	41	Very fond of salt and had taken it in large amt.	No.	No.	Hypo-myxia in nose, throat, stomach and bowels evident.
Js. B., Brixton.	Broker's clerk, underground, dusty office.	Sarcoma of the tonsil.	28	Always taken salt in large amt	Smoked nearly one oz. a day.	Yes.	Hypo-myxia naso-pharyngia et gastrica.
Wm. P., Walwark.	Dustman, very dusty work.	Carcinoma of the pylorus.	43	Taken an excessive amt. of salt always.	Smoked one oz a day for years.	Yes.	Hypo-myxia well marked in all the usual situations.

Treatment. The first patient on whom mucin was used in malignant disease was James Castle (5th on the list) residing at Walthamstow, who came to the Central Throat and Ear Hospital with a large mass of glands in parotid and cervical regions and also a hard mass bulging into his pharynx. He was suffering great pain in the throat and up the neck to the head. Mucin in the form of gargle composed of soloid and tabloid mucin co. one of each dissolved in one ounce of hot water with a third of an ounce of lime water gave him great relief and facilitated the swallowing of food. Mucin feeding was ordered and he was told also to swallow the gargle. He thus consumed from 10 to12 tabloids and the same number of soloids per day. His appetite improved and his bowels—always very costive,only having an action about twice a week—soon became regular, and although his case was a perfectly hopeless one from the first he certainly improved for a time and got a great relief from this treatment. The mass in the neck broke down and a large ulcerated surface resulted.

This was dressed with a lotion similar to the gargle, which kept the broken surface beautifully clean and sweet and greatly relieved the pain and diminished the discharges. He lived three months and was able frequently to go out, but the growth spread to the lungs and he died of pneumonia. The alleviation of the pain was certainly most marked, allowing the poor man to sleep, which he had been unable to do formerly.

The 2nd case was that of J. Jacobson (11th on the list) suffering from epithelioma of pharyngeal wall in the lower part and having a mass of glands on the left side of the neck. Mucin was used in a manner similar to that in the last case.

The pain was greatly relieved, and he was able to sleep well and had a good appetite and his swallowing was done easily.

The mass of glands diminished and at the end of one month's treatment there was a difference of two inches in the circumference of his neck. Unfortunately he contracted a severe attack of influenza and died after three days illness.

James Kent (2nd on the list) had been under Dr. Abercrombie's treatment for one month at the Central Throat and Ear Hospital, suffering from an induration of the right tonsil with a mass of gland in the neck. The case was going from bad to worse and Dr. Abercrombie kindly allowed me to use the mucin treatment. The growth had extended onto the soft palate and had ulcerated. The jaw was fixed so that he could only separate the teeth a very little way and the mouth and breath were very offensive. He was also in great pain. Mucin was used as gargle and a mouth-wash and he was given mucin feeding. The improvement was very marked indeed. The pain ceased and the circumference of the neck diminished by three 3″ in one month (21st of Feb. last). To hasten the process, I injected 1/4 of an ounce of a warm solution of mucin into subcutaneous tissue of the back three times a week and occasionally into the mass of glands in the neck. This treatment was continued for another month with good effect. The ulcerated throat cicatrized over and he could easily chew and swallow solids, so much did the jaw relax. He also gained 7 pounds in his weight. This favorable progress met with a check when two of the subcutaneous injections suppurated in succession. The reason for this I could not explain as the others had all done well, and every aseptic precaution was taken. One singular thing was that although the injections into the mass of glands were conducted in the same way and with the same fluid, yet never at any time was there any suppuration. There seemed to be a profound change in the tissues in the neighborhood of the growth. The growth continued now to increase both inside the throat and in the neck although the mucin still gave him great ease from pain, and not until the 30th of May was it necessary to perform tracheotomy. Gastrostomy was done at the same time in St. Thomas's Hospital to which he was sent on the 28th of May. The mucin treatment undoubtedly checked the growth for a time. This was proved to be sarcomatous by microscopic examination. The man is now home and still under the mucin treatment and again improving, being able to swallow.

Another case is that of Thos. Hopkins who came to this hospital complaining of pains in the throat, and up the side and back of the neck. (Case 2nd on the list.) During the last 3 months he has been having mucin treatment with great relief to his pain and the enlargement has somewhat lessened. His appetite has improved. He is very hypomyxatous, but mucin sprays and gargle have helped the pharyngeal discomfort, and his gastric symptoms are alleviated and his bowels regular. He is having mucin feeding but no hypodermic injections. Dr. Dundas Grant kindly allowed me to use mucin in this case.

Edwin Beck residing at West Ham (9th on the list) came to the Central Throat and Ear Hospital complaining of dysphagia, severe pain in the throat and sleeplessness. He was found to have an epitheliomatous ulcer in the glosso-epiglottidean region and there was a mass of glands on the left side of the neck. The mucin treatment has given him great relief and enabled him to swallow much better and to sleep at night. He is still under treatment.

The case of Arthur Reader (the first on the list) is one in which I have found mucin afford signal benefit. One month ago I did an inguinal colotomy for malignant disease in the rectum on this gentleman. As he is very hypomyxatous I had great trouble to maintain the bowels in regular action with soft stools, but mucin feeding to the extent of twelve tabloids a day—two before and two after each meal—has solved this difficulty most satisfactory, and also remedied the gastric irritation and flatulency. This is a much better means of regulating the bowels in such case, than giving oily aperients as it supplies the natural lubricant and never causes any griping pains or disturbances.

These cases in which mucin was prescribed were all in advanced stages before commencing its use but yet there was improvement in each instance. In an early stage this improvement is likely to be better maintained, and in hypomyxatous patients who have been operated upon for cancer it might be tried to prevent the recurrence of the disease. Of course, tobacco and salt were peremptorily prohibited.

45m Welbeck St.

LXIV.

THE ENDOTHELIAL PHAGOCYTES OF THE TONSILLAR RING.*

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In the tonsillar ring two forms of phagocytic cells are encountered: first, polynuclear neutrophilic leucocytes, and second, large mononuclear cells, resembling, morphologically, epithelial cells. Both these forms of cells may be observed to incorporate foreign substances, with this difference, however, that whereas the leucocytes are phagocytic for bacteria, and for a variety of amorphous detritus, the epithelioid cells, on the other hand, are capable of incorporating living cells.

Attention was first called to the fact that certain cells may become phagocytic for other cells, by Mallory[1], in a histologic study of the lesions of typhoid fever in 1898. From his observations he concludes that dilute or weak toxins produce proliferation and phagocytosis in certain cells, particularly in the endothelial cells of lymphoid tissue, and of the lymphatics.

Several years ago, in a histologic study of acute tonsillitis, I found in every case examined a more or less marked proliferation of the endothelial cells lining the reticulum of the follicles, with a formation of endothelial phagocytes. These findings led me to examine subsequently a large amount of material, with the object of ascertaining, first, whether these phenomena occurred also under normal conditions, and second, whether they bore any definite relation to infectious processes.

The following paper embodies the results of these observations.

For the satisfactory demonstration of the endothelial phagocytes and their inclusions, it is found best to place fresh tissue in Zenker's fluid, and to stain with alkaline methylene blue and eosin. Hematoxylin and eosin give much less perfect pictures.

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*From the Journal of Medical Research.

Normal Histology.—In the study of the normal histology, tonsils were obtained at autopsy which presented, so far as could be determined macroscopically, no abnormality. Material was also obtained during life from cases requiring operation for adenoid hypertrophy, in which the tonsils exhibited clinically little or no enlargement. Finally a comparative study was made of the tonsils in some of the lower animals.

Man.—In the human subject, the tonsils show, in those places corresponding in situation to the follicles, a characteristic arrangement of the connective tissue cells. With Mallory's triple connective tissue stain, the framework of each follicle is in cross-section seen to be composed of a well-developed ring or capsule, composed of from four to six concentric layers of connective tissue. With ordinary acid stains as eosin, this fibrous envelope is difficult to isolate. It may be well demonstrated by neutral orcein. The follicles present, in sections of the tonsil made of the vertical to its base, a resemblance to a signet ring, with the seal directed toward the lumen of the nearest crypt. This appearance is due to the fact that the interior of the follicle is composed chiefly of endothelial cells, which owing to their large amount of cytoplasm are sharply differentiated from the encircling collection of lymphocytes. These endothelial cells undergo segmentation in a conspicuous manner, and produce large, so-called epithelioid cells. In every case which came under examination one or more of these phagocytic cells were found in the follicles. Where but one or two were present in the follicles, they were usually situated near the centre. As a rule, not more than eight or ten were found in a cross-section of an individual follicle. The incorporated substances consisted almost exclusively of lymphoid cells and cells, and cellular detritus, probably derived from lymphoid cells, and were generally situated in clear spaces or vacuoles. Occasionally red blood corpuscles were found incorporated. Polynuclear leucocytes were not found in the cells, nor did the phagocytes appear to attack the endothelial cells. On the side of the follicle adjacent to the nearest crypt, the lymphocytes are especially numerous and closely packed. In this situation from four to six rows of lymphocytes are found between each pair of concentric rings, which are thus more or less widely separated from each other. On the side of the follicle which faces toward the fibrous trunk, but one or two rows of lymphocytes are found between each pair of concentric rings. As one passes from the lymphoid cells of the capsule of the follicle, an alteration in these cells is noticed, consisting of a gradual increase in the amount of surrounding cytoplasm, which is usually more marked on one side, and appears to be heaped up more at the periphery than in the centre. The nucleus simultaneously undergoes alterations, consisting in a separation of its chromatin into deeply staining masses, which are situated in a rosette fashion, connected with each other by fine chromatin threads. These cells possess the characters of plasma cells. All stages of transition are observable, between the typical lymphoid cells and typical plasma cells. It was not, however, observed that these plasma cells were incorporated by the endothelial phagocytes. In the mucous membrane of the crypts numbers of plasma cells, lymphoid cells, and polynuclear neutrophiles were observed. In the fibrous trabeculæ near the base of the organ varying numbers of eosinophilic cells were usually encountered, but never in the neighborhood of the follicles or of the crypts.

Lymphoid tissue was also examined from other portions of the tonsillar ring. In the lingual tonsil, the lymph follicles are numerous, and the central reticulum of each follicle is well defined. An occasional endothelial phagocytic cell was found in the majority of specimens examined, but they were less numerous than in the faucial tonsils.

In examination of the pharyngeal tonsil from children, showing what may be called normal conditions, that is, occurring in the form of mammillated projections about one-eighth to one-quarter of an inch in height, it is seen that the central reticulum of the follicle shows but a slight tendency to proliferation, and the endothelial cells are sparingly encountered. In specimens obtained from adults at autopsy, from the vault of the pharynx, there is likewise observable a distinct central reticulum of the follicles, with an occasional endothelial phagocyte.

Comparative Histology.—Sections of tonsils from an opossum, stained with polychrome methylene blue and eosin, show the follicle to be indicated by a small group of cells, possessing a large amount of non-granular protoplasm, with deeply staining nuclei. These cells correspond in appearance to the endothelial cells found in the human tonsil. Scattered among these cells are found considerable numbers of lymphoid cells, arranged in irregular lines together, with cells having the characters of plasma cells. In the germ center of each follicle are seen a few cells, resembling the phagocytes produced by proliferation in human tonsils. They consist of a relatively large amount of acidophilic protoplasm, and with an eccentrically situated, lightly staining nucleus, and contain in their interior cells and cell fragments. The cells consist of lymphoid cells and plasma cells. The nuclei of the included cells appear compact and shrunken and stain deeply.

The follicle resembles closely that found in the human subject, differing chiefly in the smaller size of the germ center, and in the larger number of lymphoid cells found in the latter.

Sections of the follicles stained by Mallory's triple connective tissue stain show the germ center of the follicle to possess a well-developed fibrous reticulum, arranged in the form of irregular channels, containing these lymphoid cells previously referred to.

Examination of the tonsil from an adult cat shows but a slight differentiation of the follicles from the surrounding tissue. The germ centers are relatively large, and contain numerous large phagocytic cells, with a variety of inclusions, situated in the center of the vacuoles. The number of phagocytic cells in a cross section of the follicle ranges from ten to twenty. Red blood corpuscles are found frequently among the inclusions. Scattered among the endothelial cells are numerous lymphoid cells. Between the follicles are large numbers of large monocular phagocytes, crowded with cellular inclusions and detritus. Some of the cells contain fifteen or twenty red blood corpuscles. The eosinophilic polynuclear cells, which occur in large numbers in the lymphoid channels, near the base of the tonsil, are at times incorporated by the phagocytic cells, but their granules disappear almost before they have been taken into the body of the phagocyte.

Staining by Mallory's method for connective tissue shows the development of the fibrous reticulum to be much less marked than in the case of the opossum, resembling in this respect more closely the human tonsil.

Several specimens of tonsil from yearling sheep were examined. The follicles resemble closely those found in the human tonsil, possessing a distinct endothelial reticulum, with surrounding lymphoid cells. Endothelial proliferation and phagocytes were present in the majority of follicles, particularly near their center. The inclusions were chiefly lymphoid cells and cellular detritus, although at times polynuclear leucocytes appeared to be incorporated. The fibrous tissue is well developed in the follicles.

Several specimens were examined in cattle. The tonsils here exhibit a penetration of mucous glands in all directions in the lymphoid tissue, but the individual follicles exhibit the ordinary type. The fibrous recticulum of the follicles is poorly developed, and proliferation varies in amount in different follicles. In some the mitotic figures are numerous, while in others none are found in cross section. The phagocytes resemble essentially those of the sheep, and contain inclusions of lymphoid cells and cellular detrius.

PATHOLOGIC HISTOLOGY.

Hyperplasia.

Of the pathologic conditions of the tonsils it seems desirable to describe first simple hyperplasia, since there is no line which separates it sharply from the normal tonsil, and especially since many of the pathologically altered tonsils which are shortly to be described were to a greater or less extent hyperplastic.

We have to consider two forms of hyperplasia: first, diffuse hyperplasia, and secondly, the so-called papillary hypertrophy.

In simple hyperplasia the most conspicuous alteration in the tonsil is a great increase in the number of the endothelial cells of the recticulum. There is also an increase to a less extent of the interfollicular endothelial cells. The lymphoid ring is, however, not increased proportionately. It even gives, at times, the appearance of a thinning, as if due to enlargement of the central reticulum. In the recticulum, as shown by saffranin, proliferation of the endothelial cells is extremely marked, and in proportion to the degree of hyperplasia present. The endothelial phagocytes are most numerous near the center of the recticulum, and are crowded with lymphoid cells and cellular detritus to a varying degree. Where in addition to the hyperplasia there is an associated cheesy collection in the tonsillar crypts, the endothelial phagocytes appear to be correspondingly increased in number, thirty or forty having been observed in a cross-section of a single follicle. In such cases the number of polynuclear leucocytes in the crypts is increased, and are found to be incorporating bacteria to a greater or less degree. Staining of the tissues by Gram shows, however, no penetration of the bacteria below the epithelium, and in no cases were bacteria found in the endothelial phagocytes. The lining endothelium of the capillaries and blood vessels showed no unusual proliferation.

Two cases of papillary hypertrophy were examined. In the first case a tonsil enlarged to the size of a pigeon's egg, and irregularly lobulated and mammillated, presented on histologic examination a marked proliferation of mucous and sub-mucous tissue, the former being prolonged upward into delicate papillæ. The endothelial lining of the connective tissue showed active proliferation. Not only is the mucosa in a state of active proliferation, but the submucosa as well, which throws upward long digitations above the surrounding level of the mucous membrane. The follicles are much enlarged, owing to a proliferation of their endothelial reticulum, and phagocytic cells are abundant. The lymphatic ring surrounding each follicle shows no especial widening, and there is no unusual collection of lymphoid or plasma cells in the interfollicular spaces, although the endothelial cells are here in a state of heightened proliferation. The crypts are filled with detritus, leucocytes, and bacteria. Sections stained by Mallory's method for connective tissue show the papillæ of the mucosa to be largely composed of connective tissue fibers, lined with endothelial cells. There is no abnormal development of connective tissue in the center of the follicles, the stain showing the enlargement of the latter to be due essentially to a heightened proliferation of the endothelial cells. The larger fibrous trunks of the tonsil show a heightened activity of their fibroblasts, and are in direct communication with the digital prolongations previously described.

A case of papillary hypertrophy, previously described by Dr. J. P. Clark, shows on microscopic examination a marked proliferation of the connective tissue of the mucosa as well as of the lining endothelial cells. The epithelial layer shows numerous mitoses, and here and there isolated degeneration of the cells. It sends down interpapillary prolongations which contain very numerous mitotic figures. The mucosa proper is crowded with lymphoid cells, as are also the lymphatic channels in the vicinity, many of which are widely dilated with these cells. The mucous membrane contains many polynuclear neutrophilies, fixed in the interspaces. The submucosa shows a marked development of blood vessels, which are distended with red blood corpuscles, lymphoid cells, and polynuclear neutrophiles.

The condition resembles closely that found in the preceding case, both in the development of the endothelial and connective cells, but does not apparently reach so marked a development. It differs from it most noticeably in the much greater infiltration of the lymph spaces with lymphoid cells.

Retrograde Metamorphosis.

A series of tonsils from adults were examined, with regard to the phenomena exhibited by the endothelial cells of the reticulum. These cases have been reported in detail[2], and only a brief résumé of the points in question will be given here. In atrophied tonsils, the follicles are markedly diminished in number. Those which are situated near the crypts are the largest, and show most active proliferation of the endothelium. Those follicles, on the other hand, more remote from the crypts are smaller, and show little or no tendency of the endothelial cells to proliferate. The follicles which are near crypts provided with a loose, mesh-like epithelium are more active than those follicles in the vicinity of the crypts lined with a more compact epithellum. In the interior of the tonsil the fibrous changes are usually more marked than near the periphery, and traces may be seen here of follicles, the germ center of which has disappeared, with the exception of a few endothelial cells, surrounded by a small collection of lymphoid cells.

Acute Inflammation.

Inflammatory processes affecting the faucial tonsils were studied under two forms: first, those occurring primarily through infection, and secondly, those produced by trauma.

In acute infectious tonsillitis the endothelial center of the follicle appears enlarged from an increased proliferation in the endothelial cells.

The number of phagocytes in each follicle ranges (in a section 2 micra in thickness) from ten to fifty or more. The inclusions in these cells do not apparently differ from those found in normal and in hyperplastic tonsils, consisting chiefly of lymphoid cells, cell fragments, and fine granular detritus. At times plasma cells appear to be incorporated. It must, however, be remembered that many of the tonsils were originally hyperplastic, and must have presented, therefore, an increased endothelial proliferation, before the onset of the acute inflammation. The appearance, in fact, of the endothelial reticulum of the follicle does not differ materially from that found in many cases of hyperplasia. A marked point of distinction was, however, present in all cases, and consisted in a proliferation of the endothelial cells of the capillaries and small vessels. These endothelial cells exhibited frequently swelling and desquamation. They were at times found lying free in the lumen of the vessels. Another point of distinction observed in these cases was the widening of the ring of lymphoid cells around each follicle. These lymphoid cells occurred also in greater numbers in the lymph channels between the follicles.

In the less frequent cases of suppurative tonsillitis, which are characterized by the presence of multiple abscesses within the follicles, examination shows the following conditions: The first indication of an abscess in a follicle consists in circumscribed infiltration of polynuclear leucocytes among the endothelial cells of the reticulum. The blood vessels in the immediate neighborhood contain large numbers of polynuclear leucocytes, some of which are seen in the act of passing through the vessel wall. The endothelial cells of the vessel show a varying amount of proliferation in swelling. Micrococci are found in varying numbers in the region occupied by the polynuclear leucocytes, lying for the most part free in the intercellular spaces, although they not infrequently may be seen in the interior of the polynuclear leucocytes, and apparently also within the large endothelial phagocytes. With the growth of the abscess the follicle increases in size, as the result both of heightened emigration of polynuclear leucocytes and of the proliferation of the surrounding endothelial cells of the reticulum. The endothelial cells of the reticulum in the immediate neighborhood of the abscess show a swelling of their cytoplasm, and an irregularity in the outline of their nucleus, which appears elongated, indented, or twisted. A marked increase is simultaneously observed in the number of endothelial phagocytes in the vicinity, which contain also a greater number of incorporated lymphoid cells and cell fragments.

Investigations were made on human tonsils to determine the effect upon the proliferation of the endothelial cells of the reticulum. In a series of six cases, a drop of chromic acid was introduced into the crypt of a tonsil, which exhibited sufficient hypertrophy to require excision, and at a varying period of time afterward the tonsil was removed and examined histologically. In all the cases examined, a necrosis of epithelium of the cauterized crypt was observed, extending for varying distance into the underlying lymphoid tissue. In the center of the necrotic area there were no polynuclear leucocytes, but toward the periphery these were encountered in large numbers. Bacteria were numerous throughout the necrosed area, and in the region of infiltration many polynuclear leucocytes were seen, usually with bacteria in their interior. Below the area of necrosis a number of lymphoid and plasma cells were observed, together with many polynuclear neutrophiles, the latter emigrating from the dilated blood vessels of the vicinity. The endothelial cells of the reticulum showed nuclear degeneration and fragmentation, but no evidence of phagocytosis was observed. The follicles in this vicinity presented traces of their endothelial cells in the form of acidophilic rings corresponding to the preexisting cell walls, filled with amorphous homogeneous material. Below this region, at a greater distance from the site of the cauterization, the follicles show an increased endothelial proliferation of the reticulum and of the intima of the blood vessels with a formation of many phagocytes.

The number of cases observed was too small to justify conclusions regarding the relative intensity of these phenomena in the different stages of the process.

Conclusions.

From these observations it is evident that in the normal tonsils, both of man and of a variety of the lower animals, large mononuclear phagocytes are present, which appear to be derived from a proliferation of the endothelial cells of the reticulum.

In hyperplasia of the tonsils there is a proportionate increase in the proliferation of the endothelial cells of the reticulum, and formation of phagocytes, without, however, a corresponding increase in the number of lymphoid cells, or in the endothelial cells of the blood vessels.

In atrophy of the tonsils, the endothelial cells of the follicles are seen first to diminish in number, and endothelial phagocytes are correspondingly few, while the lymphoid cells persist relatively longer.

In acute inflammation, the characteristic feature of the process consists of a heightened proliferation of the endothelial cells of the blood vessels, with swelling of their cytoplasm together with an increased number of lymphoid cells. These changes are relatively more marked than the increased endothelial proliferation of the reticulum with follicles. Where circumscribed abscess formation occurs in the follicles, an increased proliferation of the endothelial cells, both of the reticulum and the capillaries, is observable in the vicinity.

Where an intense irritant acts upon the endothelial cells of the tonsil, degeneration and necrosis result in the immediate vicinity. At a greater distance proliferation appears to be excited in these cells.

It seems, therefore, probable that proliferation of the endothelial cells of the reticulum, with a formation of phagocytes, is not necessarily dependent upon the influence of bacterial toxins for its production, but appears rather to stand in a definite relation to the size or activity of the organs in question. Proliferation, on the other hand, of the endothelial cells of the blood vessels was found to occur only in association with other phenomena of inflammation.

(My thanks are due to Dr. C. S. Minot for facilities kindly afforded me in his laboratory in the Harvard Medical School.)

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SECTIONS OF LARYNGOLOGY AND OTOLOGY.*

BRITISH MEDICAL ASSOCIATION (COMBINED MEETING).

LXV.

THE ETIOLOGY AND DIAGNOSIS OF ETHMOIDAL AND SPHENOIDAL SUPPURATIONS.

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ETIOLOGY.

The etiology of these two diseases corresponds in general with that of other focal suppurations of the nose; they are acute infectious disorders of general or local origin. The principal factor in the production of a chronic disease from an acute inflammation in this situation is impediment to free discharge; thus it is easy to understand at once the most frequent cause of chronic suppuration in these cavities and its comparative rarity. The sinuses in question have their openings situated at their deepest and most dependent parts—that is, under the most favorable conditions for drainage. This, however, will be altered by swelling of the adjacent mucous membrane, and to this the ethmoidal bone especially is much exposed. Such a swelling may be superadded to a previous acute inflammation of the cells themselves, or it may be the consequence of an inflammation in an adjoining cavity. It is certain that sphenoidal and ethmoidal suppurations rarely occur alone; in most cases they are combined with suppuration of other cavities, or they may occur together. Ethmoidal suppuration is found alone more frequently than sphenoidal, and this statement will be only slightly changed by the consideration of the much greater difficuly of making the diagnosis in the latter affection. In my own cases sphenoidal suppuration was combined with ethmoidal disease on the same side in 73 per cent., but in ethmoidal affections the same combination existed in 40 per cent. only. We may conclude, therefore, that chronic sphenoidal disorders are frequently secondary to those of the ethmoid bone. I have seldom met the combination of sphenoidal and maxillary antrum disease, though other authors have more frequently seen this. The combination of ethmoidal with maxillary suppurations is more common; and though I do not in the least agree with Well's view that all obstinate maxillary suppurations depend upon disease of the ethmoidal bone, I must agree that suppuration of the ethmoid alone is frequently diagnosed when only one or other of its cells may be slightly affected, whilst the more important and fundamental maxillary inflammation is overlooked.

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*British Medical Journal, August 30, 1902.

It seems unknown, but I have no doubt that adenoid growths can infect the ethmoidal as well as sphenoidal cavities directly by their secretion, and prevent by the maintenance of swelling the natural cure by drainage of these cavities when once infected.

DIAGNOSTIC SIGNS.

Subjective troubles, some of which may certainly be localized, may call our attention to the affected part. In some cases of sphenoidal inflammation no complaint may be made, but in others, vertigo, pains of occasionally excruciating character on the vertex, deeply in the head behind the eyes or, by false localization, in the region of the ears, or not uncommonly in the occiput, are present. But how uncertain subjective signs in general are, may be gathered from Schäffer's and my own observation of typical supraorbital and infraorbital neuralgia in such cases. These symptoms, unexpected as they may be, are not merely accidental, but are caused by an irritation of the sphenopalatine ganglion, the immediate neighbor of the sphenoidal cavity. A mistake may nevertheless be made by a superficial observer. We too frequently meet not only general practitioners, but also specialists harboring the thoroughly false view that the causes of pains must be found near their localization, hence the general mistake relative to the frequency of frontal suppuration.

Loss of smell frequently accompanies chronic sphenoidal suppurations in consequence of the obstruction to the fissura olfactoria.

Ophthalmic troubles, such as asthenopia, scotoma, painful irritation of the ophthalmic nerves, and deterioration of visual power, as noted by Schäffer, are explicable by the neighborhood of the orbital and the basal nerve. Pain is usually more violent in acute inflammation, but then it is, on account of radiation to more distant regions, still more uncertain as a diagnostic sign. The same holds good with disease of the ethmoid bone, only here the troubles are usually more severe than in any other cavity, and here more especially disagreeable complication of constant pain, mental depression, and intolerance to nervous excitement may be found. Asthenopia is also frequent, and the pain will often be referred to the region of the eyes. Supraorbital neuralgia may occur here as well as in frontal empyema, combined with tenderness on pressure. Special to ethmoidal disease is the pain produced on pressing the lachrymal bone, a fact which is explained by the vicinity of the lamina papyracea.

OBJECTIVE SIGNS.

I agree with Hajek in his very clear division of the ethmoid bone; he divides the whole labyrinth into cells of the upper and middle meatus, and thus the old difficulties in settling the places of discharge for anterior, middle and posterior cells are removed once for all.

Cells of the upper meatus as well as the sphenoidal antrum discharge into the recessus spheno-ethmoidalis, and the pus of both cavities will therefore more frequently flow down to the naso-pharynx than that of any other cavity and produce the well known appearance of post-nasal catarrh. When the pus runs forward, it is nearly always found in the space between the middle turbinated body and the septum. That even this localization is not of absolute diagnostic value, must be repeated; only a discharge rapidly reforming after its removal and gushing out will signify its descent from one of the cavities in question. The anterior cells empty themselves into the hiatus semilunaris or into a posterior part of the middle meatus, and their openings may thus be easily mistaken for those of the maxillary and frontal sinuses, as the openings of all these cavities are very close together.

One diagnostic sign to which I would draw special attention is the purulent and even fetid character of the secretion, in contrast with the more frequently muco-purulent or mucoid character of that from the maxillary antrum.

The *secondary disorders* of the mucous membrane are generally of less significance. A swelling in the region of the tuberculum septi, or posterior to this, arises often in the form of a lengthy ridge under the irritating influence of the pus. Though such irritation will be caused mostly by sphenoidal and posterior ethmoidal pus, it may in some cases arise from discharges of other origin, and be deposited in these places by capillary attraction.

Polypoid degeneration of the middle turbinated body is equally significant of suppurations of the anterior labyrinth and of the larger cavities. Isolated inflammations of the labyrinth hardly ever occur without the production of polypi, the mucous membrane of this region inclining particularly to edematous degeneration. When, in cases where no suppuration may have been apparent previously, multiple polypi in the region of the middle turbinated bodies are torn and not cut off, so that some bone is removed with them, it often happens that edematous growths within the opened cells or holes of the middle turbinates will be observed, a true sign of previous ethmoidal inflammation; the secretion in these cases is scanty on account of the advanced degeneration of the glands and vessels, so that it is practically hidden behind the tumors. In the same manner a production of polypi will often persist for a long time after the cessation of the ethmoidal suppuration.

The *rhinoscopic appearance* in sphenoidal suppuration alone scarcely differs from the normal, apart from the above mentioned occasional septal troubles; that of ethmoidal inflammation varies according to the different pathologic forms of labyrinthine disease.

The closed or ethmoidal empyema proper produces an expansion of the affected part of the labyrinth or its appendages (the bulla ethmoidalis or middle turbinals) and gives the aspect of a bony bladder within, or by the side of the concha.

Latent open suppuration may exist without any visible effect, but in the majority of cases there are smaller or larger hyperplastic growths on the middle turbinal, and very often the participation of the deeper tissues becomes evident by the appearance of a considerable extension of the concha, whose surface is covered with granulations or polypoid degenerations, so that it occasionally appears double.

Distinct though these appearances may be, the diagnosis will never be sure until the presence of pus within the cavities is proved. For this purpose alone we make use of the probe. Though this instrument may prove roughness or caries of the bone or the presence of loose or necrotic particles, all these signs are of but secondary value.

As to the position which the probe has to occupy in the sphenoidal cavity, and the distance of this cavity from the nasal introitus, you will allow me to refer to the rules given in my treatise on nasal suppuration. Hajek gives a very instructive sketch, showing the angle of the probe with the nasal floor, whereby one should know the right situation of the probe within the cavity, but it is impossible to give absolute measures of distances and heights of the ostium, as these differ too much to allow of any certainty. In general the ostium is situated opposite to the posterior end of the upper turbinated body, and that the probe is in the proper position, will become evident only by the impossibility of moving it downward. The same is true as regards the control of its position in the ethmoidal cells, in contradistinction to the recessus spheno-ethmoidalis (for cells of the upper meatus) and to the middle meatus (for anterior cells). Sometimes it is useful to apply the probe by using Killian's specula.

The former can be reached from the recessus by a probe with a lateral bend, the latter from the middle meatus on both sides. A division of the sphenoidal antrum by a vertical or horizontal septum can thus be recognized by the probe and has a very great practical value Whether this deformity is caused through the formation of a septum or by the dislocation of a posterior ethmoidal cell can scarcely be made out in the living subject. Congenital abnormalities in the cavity may render their exploration quite impossible. The most extreme example of this condition is my case of an accessory sphenoidal sinus behind the left normal one, with an opening into the naso-pharynx. The great variety in the formation of the anterior cells leads to a confusion, especially with the frontal sinus, and this confusion is rendered so much more possible as the "frontal cells" frequently participate in the inflammation of that extensive cavity; but luckily (for it cannot always be avoided) a mistake is of no practical importance. More weight should be laid on the diagnosis of suppuration near the lamina papyracea, for not rarely this suppuration will lead to maxillary disease, and thus the affection of the lamina alone gives one of the most certain cues to diseases or the antrum of Highmore.

Such affection will sometimes simulate suppuration in a meatus with secondary caries of ethmoidal bone. But this disease will only rarely be found present alone. For the discovery of disease of adjoining cavities the greatest value attaches to a temporary tamponade, the application of which I need not further explain. In some cases to get sufficient room it is necessary to make a resection of the anterior part of the middle turbinal, and in ethmoidal suppurations this preliminary operation can rarely be avoided for proper treatment. In sphenoidal suppuration this operation is only exceptionally demanded.

Whatever cavity may be thus explored, its suppuration will not be demonstrated, unless pus is running down along the probe, or can be drawn or washed out by a cannula. The seriousness of the disorder and the further indications for its treatment will become evident by testing the state of the bone and soft parts with the probe. Diagnosis will naturally be much facilitated by some of the signs thus obtained, especially when the probe gets immediately through the mucous tissue into cavities, by the feeling of loose bone, etc.

In doubtful cases one must never forget the examination of both sides of the nose, as it is possible that an empyema of one ethmoidal labyrinth may discharge on the other side through a septal perforation.

The diagnosis of *manifest ethmoidal suppuration* breaking through the inner corner of the eye, in contradistinction to disease of the frontal sinus, will be made not so much by the localization of the orbital abscess as by the intranasal aspect, which will be unmistakable. In case of doubt, probing the outward opening of the abscess will confirm the diagnosis. As to other secondary diseases, for example, thrombosis of the venous sinuses, encephalitis, etc., I must forego their mention as not strictly belonging to the subject under discussion; and lastly a warning must be given against wrongly diagnosing ethmoidal sphenoidal suppuration when a malignant growth is really present, the early stages of which may simulate suppuration with inflammatory hypertrophies. Only great experience and attention to the whole course of the disease can prevent such an error.

LXVI.

THE ETIOLOGY AND DIAGNOSIS OF ETHMOIDAL AND SPHENOIDAL SUPPURATIONS.

By H. Lambert Lack, M. D., F. R. C. S.,

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I have first to thank you for the great honor conferred on me. I accepted your invitation the more willingly as it gave me an opportunity of reporting further upon a method of treatment for extensive ethmoidal disease. It is eighteen months since this subject was last mentioned, and the report is already abroad that the method has been abandoned.

ETIOLOGY.

Suppuration in the ethmoidal and sphenoidal sinuses, as in the other accessory cavities of the nose, is usually due to acute rhinitis, and more especially to the severer forms of it, such as occur in the specific fevers. I need not enumerate all these. Influenza is well recognized as a prolific cause, and probably accounts for the frequency of these diseases in recent years. A greatly increased frequency seems to be a fact, and not to be entirely explained by increased zeal in diagnosis. Pneumonia, typhoid, etc., may also give rise to these affections, but probably a majority of these cases are due to ordinary colds. Catarrh and even suppuration in the accessory sinuses is probably not infrequent in connection with nasal catarrh, and chronic suppuration results when the mucous membrane lining the cells is severely damaged by the acuteness of the inflammation, when the bony wall of the sinus is affected, or when the swelling occurs around the opening of the cavity and prevents the free escape of the catarrhal products.

Three points deserve a word:

1. *The Question of Infection from other Sinuses.*—It has often been stated that the ethmoidal cells may become infected by pus coming down from the frontal sinuses, and

possibly also by pus from the antrum. That pus coming down the infundibulum should enter some of the ethmoidal cells which open into that channel, would at first sight seem highly probable, and yet I think this purely physical explanation leaves out of account a very important factor. The action of the ciliated epithelium lining the accessory sinuses does not seem to me to be sufficiently taken into account. Ciliary movement is a very great force. It is probably the great factor in removing the discharge from the nose, and it is certainly the means by which the secretion of the accessory sinuses is removed. A large sinus such as the antrum must normally secrete a considerable amount of fluid, and this will be greatly increased by catarrh. This secretion is entirely removed through a tiny opening at the top of the cavity, and its removal therfore depends entirely upon the ciliary action. Now if the cilia are able to remove secretion from a cavity it seems to me that it would be impossible for fluid slowly oozing down from another cavity, such as the frontal sinus, to enter the ethmoidal cells in opposition to the ciliary stream. Of course, when, as the result of extensive disease, pathologic communications exist between two sinuses, this argument does not hold.

It is also, I think, because this factor has been left out of account that wrong deductions have been drawn as to the frequency of sinus suppuration from the results of necropsies. Just before death—possibly some hours before—the action of the ciliated epithelium becomes enfeebled and possibly ceases, and thus it is to be expected that the cavities would in many cases contain secretion, especially if there has been any catarrh. If the patient had not died the cilia would probably have entirely removed this secretion, and therefore it is wrong to consider a little discharge in a sinus evidence of chronic suppuration.

2. *The Question of Ozena.*—There is perhaps even yet not complete agreement upon this subject, although the balance of opinion probably leans decisively to one side. In my own experience—and I have carefully observed these cases and taken great interest in them for the past five years—the discharge in ozena or atrophic rhinitis can be entirely stopped without in any way treating the sinuses in at least 80 per cent. of the cases. The treat-

ment consists in thorough cleansing of the nose and constant packing with antiseptic gauze. This packing of the nose would tend to aggravate rather than to cure suppuration in an accessory sinus, and if therefore by this treatment the discharge in ozena can be stopped, it follows, I think, that the sinuses cannot be held responsible for it. In about 20 per cent. of cases, or less, one or more sinuses contain pus, and in my opinion this is secondary to the ozena. The ethmoidal cells are rarely affected, but probably may become so when a large crust forms in the upper part of the nose and dams back the discharge into the openings of the cells. The sphenoidal sinuses are apparently more often involved. The fact that a large proportion of cases of sphenoidal sinus disease recorded in this country have occurred in atrophic rhinitis, points rather to the fact that in this affection the diagnosis is greatly facilitated, and suggests that a large number of cases of sphenoidal disease are overlooked.

3. *The Question of Nasal Polypi.*—Nasal polypus is sometimes the result of sinus suppuration when the suppuration has led to erosion of the mucous membrane and caries of the underlying bone. Sometimes probably the caries of the bone and the suppuration in the sinus both result from the same original cause. Sometimes also the polypi, by preventing the overflow of the discharge, may lead to an acute catarrhal suppuration becoming chronic, or drive the pus into the cavities. In this way polypi may become a source of chronic sinus suppuration, or may lead to its spread.

TREATMENT OF ETHMOIDAL SINUS SUPPURATION.

The treatment of ethmoidal suppuration depends upon the extent and situation of the disease. Thus the subject may be divided into 1: Suppuration in the anterior ethmoidal cells, (*a*) limited to one or two cells, (*b*) extensive involvement of the ethmoidal labyrinth; (2) suppuration of the posterior ethmoidal cells; (3) suppuration of the ethmoidal cells, with orbital fistula or abscess, or with cerebral symptoms.

I think it will be granted that in suppuration in the ethmoidal cells operative procedures are invariably indicated.

These may be divided into: (1) Minor intranasal methods, such as the opening of one or two cells under local anesthesia with sharp hooks or cutting forceps; (2) curettement of the ethmoid; (3) external operation.

1. The details of the minor intranasal methods are familiar to all of us. In the first place, any polypi or hypertrophies which may be present must be removed, together with the anterior end of the middle turbinate. This clears the approach to the anterior ethmoidal region, and the affected cell or cells must then be carefully located. At a subsequent sitting, the parts must be thoroughly anesthetized with cocain or cocain and suprarenal extract solution. In my opinion the freshly made solution of suprarenal extract prepared by the method of Peters gives the best results. When the anesthetic has sufficiently acted, the affected cell is opened with a pair of nasal scissors, or with a sharp hook such as Hajek's, and its wall subsequently cut away piecemeal with Grünewald's forceps. When there is not much bleeding the interior of the cell can be inspected, and the mucous membrane if extensively diseased, should be curetted. I think it is a great point to use the curette as little as possible. In the majority of cases the mucous membrane, unless very extensively diseased, will soon become healthy when free drainage has been provided, and its removal by baring the bone only delays the cure and opens the way to spread of the infection. After one or more cells have been opened in this way, a pause is necessary to allow the inflammatory reaction to disappear. Much edematous infiltration is commonly set up, and may last two or even three weeks, and this must be allowed to subside before further operation is undertaken.

A caution must also be given as to packing the nose for hemorrhage. This is very rarely required, and it is dangerous as it prevents the outflow of pus, and consequently may dam it back into other cells.

The great objection to this method is that it allows of very little being done at each sitting and consequently a large number of sittings are required. Blood soon obscures the view and the patient soon becomes intolerant, as in this region the anesthetic rarely extends deeply and never completely removes the pain. The advocates of this operation, even those who maintain that there is no alternative method, admit that the tediousness of the treatment drives patients to give it up, at least as soon as the most urgent symptoms have been removed. Thus Hajek states that in extensive cases a "half-cure" is the most that can be expected and considers it is all that should be aimed at. He would keep such cases under observation after the pain and headaches have disappeared, removing polypi and hypertrophies from time to time and letting the discharge continue. This frank report of the results is, I believe, in accordance with general experience.

The method is useful in certain cases. It may be employed with advantage when the disease appears very limited, that is, when a cure may be anticipated after a few sittings. It is also the best method when serious or acute symptoms are present and when from age or other reasons a more radical procedure must be avoided. As a curative measure in cases of extensive disease it is both inadequate and dangerous.

2. *Curettement of the Ethmoid.*—The details of this operation I have already described elsewhere, and would now emphasize only a few points. The anesthetic, preferably gas and ether, must be light as in all operations on the air passages attended by hemorrhage, so as not to abolish the reflexes completely. The postnasal space should be plugged when the posterior ethmoidal cells are not affected. For scraping, ring knives should be used; much more can be removed with them and with much less force than with a sharp spoon. The blade of the knife should be directed outward, and fairly firm pressure may be exerted in this direction without danger. Should the orbital plate be perforated or removed, and the orbital periosteum exposed no ill effect will follow. No force at all should be used in scraping upward for fear of injuring the cribriform plate. This is a point I wish to insist on most strongly, as on it depends the safety of the operation. In a recent discussion one surgeon said that it would be difficult to push a large ring knife up to the cribriform plate. If the operation be performed under this delusion fatal results sooner or later are inevitable. The chief points to

ensure safety are to use a ring knife, large and sharp, which requires little or no force, and is very effective, and, secondly, not to scrape forcibly in an upward direction.

The operation must be continued until every piece of soft bone and degenerated mucous membrane has been removed. This may be completed by using a smaller size of ring knife with great care. On introducing the finger into the nose at the end of the operation it will usually be found that the antrum has been freely opened from the middle meatus so as to admit the passage of one or two fingers. It is further, I think, advisable to puncture the antrum from the alveolar border in all these operations. At the end of twenty-four hours the antrum is irrigated and clots and dèbris washed out. Should pus be found, a tube can be inserted and the antrum treated as for empyema. It may also be found, as already stated, that the periosteum of the orbit has been laid bare, and in the majority of cases it is probable that this scraping extends down as far as the orbital plate of the ethmoid. It is also probable that in a large number of cases the uppermost ethmoidal cells are opened. In a recent case, which I have shown to some of my colleagues, operation was performed for extensive suppuration and polypi in the anterior and middle ethmoidal cells. After the operation, a large dry cavity was formed in the upper part of the nose, and on examination the posterior end of the middle and the whole of the superior turbinate were fully exposed. This enabled one to locate the situation and extent of the large cavity in the anterior part of the nose, and demonstrated that the whole of the cells had been removed quite up to the cribriform plate.

After-Treatment.—The best after-treatment consists in doing as little as possible. The nose should not be packed unless required for hemorrhage, and then it is better to remove the packing next day and not replace it. After the first twenty-four or forty-eight hours the nose should be very gently irrigated. The packing has a tendency to prevent the outflow of any pus which may be present, and thus to give rise to septic infection and fever, and possibly is attended by the danger of infecting other sinuses. Certainly these troubles, and also suppurative otitis, seem to be less since the packing has been discontinued. Syringing also, especially if force be used, may produce otitis, and therefore it must be carefully employed and watched.

Progress.—For the first week or two after the operation granulations which often seem extensive and edematous, may appear in the upper part of the nose and may be accompanied by suppuration. These are best left alone. Occasionally a piece of semi-detached mucous membrane or bone has to be removed after the operation; but granulations usually subside after a time. In the majority of cases a cure is obtained, and it is easier to speak decidedly in these cases than it is with regard to nasal polypi, for a case must be considered a cure if a large dry cavity forms in the upper part of the nose and all suppuration ceases, and the edema of the mucous membrane and polypi have been removed; whereas in speaking of a cure for polypi a considerable time must be allowed to elapse. Of course, a cure does not invariably result. The entire disease may not be removed or other sinuses may be affected; but in the majority of cases complete healing takes place in from two to three months after the operation.

Ill Results.—The following is a full account of the ill results that have been noted: In a small proportion of cases there has been a rise of temperature to 101°, or even higher, for a few days after the operation; this is probably due to slight septic absorption from the raw surface, and soon subsides. In one or two cases a temperature of 103° or 104° has been noticed, but has usually fallen within twenty-four or forty-eight hours, and in no case has been attended by serious trouble. Headache has been rare and has soon passed off, and is probably due as much to the anesthetic as to the operation. Suppurative otitis media has occurred in a small percentage of cases; it has only been noted when patient had previously suffered from the same disease and had never been severe. In a few cases adhesions have formed between the outer wall of the nose and the septum. These are often mere strands which, when healing has taken place, can be easily divided with the galvano-cautery. In one or two cases they have been very extensive, but beyond obscuring the view of the upper part of the nose apparently did little harm. They may be the result of somewhat unusually acute inflammation following the operation, but in all probability they are also due to more or less injury in the septum. It is in this direction that if care be taken they probably may be avoided. It is possible they could be prevented by prolonged packing of the nose, but this for other reasons seems to me inadvisable. In one case, as already reported (see Proceedings of the Laryngological Society, London, December, 1900) an abcess formed in the lower or inner part of the orbit in connection with necrosis of the nasal portion of the superior maxilla, and had to be opened. For three months a sinus existed and then an incision was made into the orbit and a sequestrum removed, and the patient did well.

In commenting on this operation in the *British Medical Journal* and also in the *Centralblatt*, Sir Felix Semon mentioned that he knew one death had already occurred. There has been, so far as I am aware, only this one death, and in justness to the operation I must add that it was due, in my opinion, to avoidable causes, and therefore should in no way be allowed to depreciate the value of the operation. Indeed, further experience seems to me to prove that the operation is both safe and efficient, and at the present time nothing has been recommended which could replace it.*

3. *External Operation.*—The indication for this procedure is an abscess or sinus in the orbit in connection with disease in the ethmoidal cells. If urgent cerebral symptoms be present, I think operation by this method should also be recommended, but it should not be performed simply for ethmoidal suppuration. The operation is an easy one to carry out, and is somewhat similar to an operation for frontal sinus disease. An incision is made, commencing near the supraorbital notch, just below the supraorbital margin, curving downward and inward, and ending shortly below the inner canthus. It is carried at once down to the bone, and the periosteum is detached far back along the inner wall of the orbit. In this way the abscess in the orbit is sure to be opened, and if a sinus exists be-

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*If any reader should know of a fatal case following this operation the writer would be extremely glad to be informed of it. Of course, nothing would be published without permission, and the report would be regarded as strictly confidential.

tween it and the ethmoidal cells, through a perforation of the lachrymal plate it will be exposed. With a fine sharp chisel the lachrymal plate should now be cut away so as to freely open the sinus and expose the anterior and middle ethmoidal cells. By curetting with a ring knife, either through the opening thus made or through the nose, guided by a finger passed in through the wound, the whole of the ethmoidal cells can be broken away; and it is possible definitely and precisely to clear out every ethmoidal cell as far back as the sphenoid. The bleeding is free, but by careful sponging every step of the operation can be carried out under direct view. When the operation has been completed I have closed the wound with a few interrupted stitches, allowing an interval for the passage of a large tube which is brought out at the anterior nares. After seven to fourteen days this tube has been replaced by a plug similar to that recommended for frontal sinus cases. The result has been excellent, a complete cure having resulted, and the scar is not very unsightly. I should not, however, be disposed to consider this as an alternative method to the one above recommended for all cases of extensive ethmoidal cell disease.

Summary.—From the above consideration, I should be inclined to draw the following conclusions:—(1) That minor operations under cocain anesthesia are to be recommended only in very limited ethmoidal cell disease; (2) that curettement of the ethmoid is the best operation in the large majority of cases; (3) that external operation is safest and best when urgent cerebral or orbital symptoms are present.

TREATMENT OF SUPPURATION IN THE SPHENOIDAL SINUS.

The method of treatment depends in the first place upon how the diagnosis has been effected. Whilst operating for polypi or suppuration in the posterior ethmoidal cells it is always advisable to pass the finger well up through the post-nasal space into the posterior part of the nasal fossa, to examine the posterior ethmoidal region and the anterior part of the sphenoid. In doing this, caries or softening of the bone forming the anterior wall of the sphenoidal sinus may be detected and the softened bone may easily give way on pressure. Should this occur, a large opening should be broken into the sphenoidal sinus with the curette. In three cases I have successfully accomplished this. One may be briefly related as an example:

A girl, aged 19, was first seen in July, 1897, suffering from nasal obstruction and intensely fetid discharge from the left side of the nose. Large semi-gangrenous polypi were seen far back in the left nostril. As the polypi recurred several times after removal with the snare, the patient was admitted to the hospital, and general anesthetic administered. The polypi seemed to grow from the posterior part of the ethmoid, which was extensively carious, and easily broken down with the finger and the curette, the posterior half, or more, of the middle turbinate being removed. Whilst exploring and curetting this region, a large carious patch was felt on the anterior part of the sphenoid, which gave way on slight pressure, and the tip of the finger suddenly entered a large cavity. Careful location showed that this cavity could only be the sphenoidal sinus, and the opening into it was further enlarged by breaking down the carious anterior wall with the curette and finger. The patient was acutely ill for a few days with high temperature, sickness and headache, but recovered without special treatment, and at the end of a week was well. Subsequently there was no recurrence of the polypi, and the fetid discharge entirely ceased. After the nose had healed, a large irregular opening in the anterior wall of the sphenoidal sinus could be plainly seen from the front; this opening has remained permanent, and there has been no recurrence of the disease. The case illustrates the importance of examining the anterior wall of the sphenoid with the finger in all cases of suppuration in the posterior part of the nose, the ease with which the sinus may be opened in some cases by the finger and curette, and the permanence of the opening that is made. A further point of interest is that the polypi in this case were semi-gangrenous and intensely fetid, and another exactly similar case has occurred in my practice. The cause of this is not easy to explain, but the fact may be of diagnostic importance.

This method of treatment, however, is only applicable to cases in which there is caries of the anterior wall of the sinus. In the majority of cases the first step in treatment, if it has not already been taken in connection with the diagnosis, is to clear the approach to the natural opening of the sinus so as to bring it into view. This means removing the posterior half or more of the middle turbinate, except in a few cases of atrophic rhinitis, where the middle as well as the inferior turbinate is atrophied when the ostium of the sinus may be visible from the front. When the ostium of the sinus has been brought into view a cannula should be passed into it and the sinus irrigated. Then the probe should be introduced, and if no definite disease can be detected in the sinus, it may be treated for a time with daily irrigations with a mild antiseptic, such as boracic acid. If this treatment does not effect a cure or greatly reduce the discharge within ten days or a fortnight, a few applications of strong antiseptics may be tried. The best of these is a fairly strong solution of sulphate of copper. A few drops of a 2 per cent. to 5 per cent. solution of sulphate of copper may be injected into the sinus, left for a few seconds, and then thoroughly washed away with boracic acid. This means is warmly recommended by Hajek. I have been very pleased with it in cases of antral suppuration, but have no experience with it in sphenoidal sinus disease. It seems well worthy of a trial.

Should treatment by irrigation fail, or should the opening of the sinus be extremely small, or should caries of the sinus walls be detected, an operation must be undertaken. The best method is to enlarge the natural opening of the sinus with some such instrument as Hajek's hook under cocain anesthesia and direct illumination. With these hooks the anterior wall is broken down by pulling in an anterior and downward direction, and the detached fragments can then be removed with Grünwald's forceps. Subseqently the opening can be enlarged rapidly by cutting it away with a pair of Grünwald's forceps. In this way a large opening can be made or, if desired, almost the entire anterior wall of the sinus can be cut away.

Should the sinus contain polypi or granulations its interior can be scraped out. Here, as with the other sinuses, it is best not to attempt to remove the entire lining membrane, even where it is extensively diseased; healing will usually take place when free drainage has been established, and this can be hastened by irrigation with simple antiseptic solutions and the occasional application of a stimulant or caustic, such as a strong solution of sulphate of copper.

The results of these operations as far as my small experience goes are good. The opening made remains permanent and the interior of the sinus soon becomes dry. Of other methods of operating I have no personal experience, and must therefore speak very briefly. It has been recommended by several specialists that where the opening of the sinus is inaccessible the anterior wall may be bored through from the front. This seems to me an extremely risky procedure, owing to the extremely great variability in size of the sphenoidal sinus. I do not think it could ever be safe to bore through the anterior body of the sphenoid in the hope of reaching the sinus, unless its position and extent had been carefully located beforehand by passing a hooked probe in through the natural opening of the sinus.

It has also been suggested that the sphenoidal sinus can be reached through the ethmoidal cells by means of an external operation such as I have just described. In a case recently reported, an incision was made in the inner angle of the orbit, the ethmoidal cells exposed, and then instruments were thrust blindly through the ethmoidal cells toward the sinus. This of course must be condemned. It may be possible to clear out the ethmoidal cells regularly and systematically as above described until the sphenoidal sinus is reached, and then to continue inward and open and clear out the sphenoidal sinus. This operation is easily performed upon the cadaver, but in the living subject the amount of bleeding, the small diameter, and great depth of the wound would make such an operation extremely tedious and difficult.

Lastly, Jansen recommends opening the sphenoidal sinus through the antrum. Of this method also I have had no personal experience, and would therefore rather not speak. In conclusion, this sinus is only a single and not very important cell. It may be treated by curetting, guided by the finger, or opened as a single suppurating ethmoidal cell would be under direct illumination.

Discussion.

Dr. N. G. Haring, Manchester, thought that sphenoidal empyema occurring alone was often syphilitic; otherwise it was generally associated with ethmoidal disease. Curetting the ethmoidal cells so as practically to destroy them had sufficed to remove all headache and depression in 10 cases of which he had notes, but in only 3 of the ten was the discharge quite cured. *Postmortem* records showed that pus in accessory sinus was not necessarily very detrimental to health. Operations should only be performed to relieve distinct symptoms, and no absolute cure of discharge should be promised, although great benefit might fairly be expected.

Dr. McBride, Edinburgh, felt that his experience of the affections under discussion was too limited for him to assume the roll of critic. The difficulties of diagnosis were great in frontal and ethmoidal suppuration, as the cases were frequently complicated. The relation of polypus formation to nasal suppuration was a point as yet undetermined. Points of diagnosis were easily arranged on paper but difficult to apply in fact.

Dr. Greville McDonald, London, confined his remarks to the questions concerning the posterior ethmoidal and sphenoidal cells. After referring to the paucity of cases where a positive diagnosis of sphenoidal suppuration was possible, he referred to the persistence of pus between the middle turbinal and septum as evidence of posterior ethmoidal cell disease, and pus lying on the posterior nasopharyngeal wall, especially if it could be traced upward in front of the anterior face of the sphenoidal sinus, as evidence of sphenoidal empyema. He then related a case of sphenoidal disease where operation on the posterior ends of the turbinals, to secure irrigation, was followed by orbtal aneurysm, which was subsquently cured by ligature of both carotids, undertaken by Mr. Charters Symonds. Finally he related an empirical method of gaining irrigation of the posterior superior regions of the nose, by allowing the patient's head to hang backward over the end of a couch, and pouring, not syringing, a small quantity of 5 per cent. boroglyceride solution into the nostrils. In this way, very cautiously tried, he had frequently secured the hapiest results, and in some cases had cured disease of many years standing.

Dr. P. Watson Williams, Bristol, believed that influenza was the immediate cause of the great majority of cases of ethmoidal and sphenoidal sinus disease. The diagnosis was often a matter of very great difficulty in these cases, for though the symptoms might be highly suggestive of ethmoidal cell or sphenoidal sinus disease, it often happened that at the time one saw the patient the discharge did not happen to be exuding, and it was not justifiable to open the suspected cavities unless continued observation made the extension of disease almost certain. He considered that a point of some value in differentiating between posterior ethmoidal cell and sphenoidal sinus disease, lay in the tendency for pus from the latter to lie on the roof and posterior wall of the naso-pharnyx, while in the former it was more often found in the posterior choanae and lying on the soft palate. In treating ethmoidal cell disease he generally relied on gas or cocain anesthesia, as it was then possible to observe the parts one was operating on.

Speaking of the relative frequency of suppuration in the sphenoidal sinus and posterier ethmoidal cells, Dr. W. Jobson Horne, London, considered it had been overstated. His remarks were not applicable to the anterior ethmoidal cells. Suppuration in these cells was commonly part and parcel of disease in the frontal sinus itself, with which they were anatomically and developmentally associated. The over-estimation of the frequency of pus in the posterior ethmoidal cells and in the sphenoidal sinus was to be explained by the statistics being based upon *post-mortem* appearances, which had been misinterpreted, The presence of muco-purulent matter in these cells did not in itself amount to disease of the cell wall; the presence of the matter could readily be explained by inspiratory suction immediately before death. He had frequently examined the sinus in a dead horse, and had met with muco-purulent matter suggesting at first glance disease; but in the absence of any evidence of morbid change in the walls of the sinus, disease had to be excluded.

Dr. Adolph Bronner, Bradford, thought that Dr. Lack's treatment of ozena by packing of the nares might lead to secondary disease of the accessory sinuses, which in even one or two years might cause recurrence of the nasal ozena. Chloroform was preferable to ether, as the latter seemed to cause greater hemorrhage and local secretion of mucus. Dr. Bronner thought that local treatment without a general anesthetic, and with forceps, etc., should be tried first, and then local applications of aristol, or spirits of wine or formalin, used for several months before the larger operation was performed. Deaths from radical treatment were more common than was generally believed. In cases with very offensive discharge there was probably syphilitic caries.

Dr. Scanes Spicer, London, agreed generally with what had been advanced by Dr. Lack; except that which concerned position of operation in those cases where radical measures were necessary. The speaker strongly advocated the performance of all such operations on these sinuses in the ordinary rhinologic sitting position in an armchair, in order to secure the maximum safety and efficiency. The whole field of operation was then (with intranasal mopping) in view practically the whole time—an immense advantage considering the proximity of the cribiform and orbital plates. For some years now he had used that position exclusively for these cases. With a really efficient anethetist, anesthesia with gas and ether followed by choroform had been repeatedly maintained for one hour and a half, and without any untoward or even threatening result. Likewise he did not favor plugging the posterior nares during operation, that procedure causing the blood to be dammed forward into the nose, so that the manipulations were carried on blindly in a pool of blood. It was quite easy to keep the air passages clear, even if hemorrhage were free, and for that purpose he directed one dozen new, coarsely-pored sponges the size of a tangerine orange to be prepared for every operation, and one assistant was toled off to keep these rinsed and squeezed out dry in a bowl by the patient's right side. These were used with the fingers by both operator and anesthetist.

In this way the experienced nasal surgeon could in most cases see where he was, and avoid dangerous parts and do exactly what he wanted under all anesthesia—an immense advance in the treatment of these conditions.

The speaker had on Dr. Lack's recommendation tried Meyer's adenoid ring knife in breaking down ethmoidal cells and polypi, but he had returned to Dr. Grünwald's curettes and forceps, as he thought the ring knife was very clumsy and less easily controlled here. On two occasions after extensive ethmoidal operations he had noticed a temporary stiffness of the eyeball on the affected side which had passed off in the course of a few days. He had for many years now adopted the principle of following up the disease, whether pus or polypus, into the cells of the ethmoid or sphenoid or wherever situated, usually after resection of the middle turbinated bone. Both operator and patient had in nearly every case been satisfied with the result, great relief having been given to symptoms and intervals of three, four, and five years immunity from polypus and suppuration secured. In some severe and complicated cases he could claim such prolonged immunity as to amount to a radical cure, though he fully recognized the necessity of giving a most guarded prognosis on this point, because it was always difficult to make sure of having removed every trace of the disease.

In really experienced hands there was practically no risk from the operative procedures themselves, carried out in the way he had described, though there might be considerable danger from the disease for which the operation was undertaken. In any case the patient was safer when the retention of pus under pressure was guarded against by free drainage of diseased cells.

No doubt great stock would be made in certain quarters of the rumors of unfavorable results which had been brought forward that day. It should be observed that no information was forthcoming as to the conditions of the patient for which the operation was done, the name and status in rhinologic disease of the operation, the circumstances of the operation, or the position in which the patient was placed for operation, whether it was a blind grope in a prize packet bag or done under full illumination. These were pre-eminently cases for the experienced rhinological expert. He disclaimed any desire to assert that an unfortunate termination might not attend the proceedings of the most experienced rhinologists, but it was notorious that nowadays many persons utterly inexperienced in nasal surgery were rash enough to dabble in these difficult cases, while others equally inexperienced made great capital out of any unfavorable result, tried to alarm the public and instil distrust into them of nasal surgery.

Sir Felix Semon, London, summarized the impressions which the discussion had made upon him, and dwelt (1) upon the diagnostic difficulties in these cases; (2) the operative results and risks; (3) the ciliary theory advocated by Dr. Lack, which seemed to offer him a very satisfactory explanation of the astounding difference of the frequency of affections of the accessory sinuses as observed during life and after death. He had never doubted that the frequency with which pus had been found by very reliable observers in these cavities after death in cases in which during life no corresponding symptoms whatever had been observed, was only explicable by the assumption that the matter had found its way into these cavities after death, or, more probably, during the agony; but the *modus operandi* had not been clear to him, and he thought Dr. Lack's explanation was very ingenious, and very likely to be true.

Dr. Herbert Tilley, London, thought that the chronic antral suppuration was not uncommonly the prime factor in inducing suppuration in the ethmoidal cells, and quoted a case in support of this view. He thought Dr. Lack's theory of the action of the cilia in preventing pus entering the ostia of the sinuses of little practical importance, because pus in contact with the nasal mucosa would quickly produce edema and inflammation, and this would bring about retention of pus under pressure and the latter would be forced into any neighboring opening of a sinus. In the diagnosis of sphenoidal sinus suppuration the whole middle turbinal should be removed, so that irrigation could be, as a rule, easily carried out, thus rendering the diagnosis more easy than would otherwise be the case. The sitting position under anesthesia was invaluable, because the patient was in the usual position in which examination was made and the parts seen in their natural relationship. His experience was that all cases of chronic frontal sinus empyemata were associated with suppuration of the anterior ethmoidal cells.

Dr. Wild, Zurich, desired to recommend Professor Killian's rhinoscopia media as a most valuable aid both in the diagnosis and treatment of diseases of the accessory sinuses. With the long speculum it was often possible to see where the pus came from and to inspect the openings of the ethmoidal and sphenoidal cells, to examine them with a probe, or brush them out with a canula.

Dr. F. H. Westmacott, Manchester, thought that instead of speaking of suppuration of the anterior or posterior ethmoidal cells, and of the frontal and sphenoidal sinuses with those cavities, they should rather group the cases as suppuration of the cells of the middle, or of the superior meatus respectively. Pus from the cells in either meatus was practically certain to infect the proximate cells. The sphenoidal ostium could not be seen without removal of the whole of the middle turbinal. He advocated the sitting posture for operation (under cocain) as one's ideas of topography were undisturbed. The frequency of these affections in Manchester was probably, as in Vienna, largely a matter of climate. The presence of ciliated epithelium in sinuses which contained pus *post mortem* might, he thought, be considered proof that the pus had found its way in during life.

Professor Onodi, Buda-Pesth, referred to the method proposed and carried out by Jansen, of opening the sphenoidal sinus through the maxillary antrum. He had examined twenty-five skulls, and found that the operation was anatomically possible in only three of the twenty-five. Under normal conditions the operator would either first enter the nasal cavity on the mesial side, and then the sphenoidal sinus, or he would damage the vessels and nerves which passed through the spleno-palatine foramen. The ordinary nasal route was the only safe way to the sphenoidal sinus.

Dr. Sam Lodge, Halifax, referred to three fatal cases of sinus suppuration. A man of 65 had sarcoma of the maxillary antrum, and protrusion of the eyeball. *Post mortem*, double sphenoidal empyema was found with erosion of the posterior wall and purulent meningitis. The case was not operated on. A mill girl of 28 was operated on for empyema of the frontal sinus. Pus and granulations were found, but head symptoms continued and the empyema returned. At a second operation an erosion of the sinus wall was found leading to a large subdural abscess, which was evacuated, but the patient died of meningitis. A man aged 31 had syphilitic erosion of the wall of the sphenoidal sinus. No operation was performed. He died of meningitis.

Professor Grünwald, in reply, agreed with Dr. McBride that the diagnosis was difficult, and often was only made in the course of treatment. The diagnosis was much more difficult than the treatment. He agreed with nearly everything Dr. Lack had said, but could not endorse his recommendation to operate in the recumbent position, and under general anesthesia. His experience as to the comparative rarity of these diseases agreed with that of Dr. Felix Semon. If it had not been for the influenza epidemics, he would not have gained the experience necessary to enable him to stand there and discuss the subject. The sphenoidal sinus should be treated by the straight open way of the nose; any other method was dangerous.

Dr. Lack thought his operation had the double advantage of clearing up the diagnosis and furthering the treatment. He greatly preferred the prone position for the patient.

SECTION OF OTOLOGY.*

LXVII.

THE STUDY, TEACHING, AND PREVENTION OF DISEASES OF THE EAR.

BY WILLIAM MILLIGAN, M. D., ABERD., PRESIDENT.

Allow me in the first place to offer to you a hearty welcome to Manchester and to the Owen's College, and in the second place to express the hope that the discussions which have been arranged and the papers which are to be read, may prove interesting and profitable to one and all.

The importance of otology as a special department of the healing art, the rapid strides which have been made during recent years in the evolution of the principles and practice of aural surgery and the ever-increasing number of professional men who are devoting their lives to its study will, I think, be regarded as reasons which justify the establishment, this year, of a section devoted entirely to the consideration of problems of otologic interest.

An extended and perfected knowledge of the anatomic relations of the middle and internal ears, and a more accurate acquaintance with the paths along which pathogenic organisms are prone to travel to vulnerable structures contiguous to the ear have placed the practice of aural surgery upon a much more scientific basis than was formerly the case.

Emancipated as aural surgery to-day is from the yoke of procrastination and quackery it is rapidly assuming a more and more important place in the practice of our profession, and I take it that the gathering here to-day of so many well-known workers in otology is a tribute to the desire we all have to contribute so far as lies in our power, by discussion and by argument, to the advancement of our specialty.

Whilst fully recognizing the important strides which have been made in past years, it is incumbent upon us to look ahead, and to endeavor by individual and by united effort to extend the usefulness of our department, and to attempt to unravel some of those problems which enshroud the pathology and treatment of certain forms of ear disease. The stimulus given to British otology by the formation of the Otological Society of the United Kingdom, has, I believe, already borne fruit, and will I trust in the future bear more and more.

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*British Medical Journal, August 30, 1902.

The mass of otologic literature which to-day is to be found flooding medical and surgical journals, both general and special—an evidence at once of the increasing interest in this subject—is nevertheless becoming an increasing burden in the everyday work of the aural surgeon, who is anxious to keep abreast of the times, and be conversant with the work of his *confreres* in this and other countries. The problem of keeping pace with the mass of literary work would, I think, be much simplified were the otologic societies of Great Britain, France, Germany, Austria, Italy, America, and Spain, to form an international bureau for the advancement of otology, whose business would be to publish a biennial epitome of the principal work done in these several countries, such epitome to be under the supervision of competent collaborators elected by the respective otologic societies. The necessity for systematic instruction in otology is also, I believe, becoming more and more appreciated by the senior student and junior practitioner. The fifth or clinical year, which is now obligatory, should tend in time to stimulate this desire, and the facilities now afforded for the teaching and for the study of otology in all great medical centres is vastly superior to what existed ten years ago. Still greater encouragement should, I think, be given to the study of the special organs, and not the least the study of the ear, and I look forward to the time when the various degree-giving bodies may encourage the taking of an honor's M. D. degree in otology, in ophthalmology, in laryngology or in dermatology.

The extraordinary frequence of ear disease in children and its consequences both from the social and national point of view are such that no excuse I think is needed for emphasizing the necessity of insisting that every qualified practitioner as he leaves the portals of his university or his college carries with him some definite credential that he is competent to deal with the more ordinary affections of this organ of special sense. To any one who holds a hospital appointment the prevalence of ear disease following the exanthemata, must again and again have left its impress, and the knowledge that early and rational treatment might, and in all probability would, have saved many an ear and many an individual from permanent disability in the battle of life, cannot but cause a pang of regret.

Are we as a body of aural surgeons doing all in our power to mitigate this evil? Are we bringing the weight of our combined authority to urge the powers that be to insist upon a knowledge of the principles and practice of the more ordinary forms of ear disease by the medical student of to-day and of to-morrow? As a small aid to this consummation I am convinced that if the authorities of fever hospitals were to exact that every candidate for the post of house-surgeon or house-physician should be required to show a certificate testifying to his acqaintance with the principles and practice of ear disease a great step would be taken—a step which would doubtless have its practical bearing in the early detection of ear disease amongst those suffering from the exanthemata, and in the more efficient and more scientific treatment of suppurative lesions.

Gentlemen there is much to be accomplished. Many fields of inquiry are open and are yearning for willing investigators. To the scientific worker the field of pathology and of bacteriology has an almost limitless horizon. The practical bearing of an increased acquaintance with the exact mode of origin and the course of disease is so obvious as to require no accentuation. Our duty lies not only in the sphere of endeavoring to relieve the sick and suffering, but also in the greater sphere of preventive medicine.

How much serious ear disease is preventable we know full well. Let us as a body co-operate to provide ever-increasing educational facilities to the rising generation of medical men, so that at least one scourge to suffering humanity may be lessened by increased acquaintance on the part of the profession with the principles and practice of aural surgery.

LXVIII.

THE AIMS AND LIMITATIONS OF INTRANASAL SURGICAL PROCEDURES IN THE TREATMENT OF CHRONIC NON-SUPPURATIVE MIDDLE-EAR DISEASE.

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It has so frequently been my lot to discuss the question before us that I fancy my views are fairly well known to those who are interested in them. At the same time, since I have been honored by the request to act as one of the introducers of this discussion, I feel that a renewed confession of faith is called for. Perhaps I can best fulfil this obligation by recapitulating the summary of my conclusions as they appear in my work on *Diseases on the Throat, Nose and Ear*.

1. Let adenoid vegetations be treated in all cases of catarrhal middle ear disease. The same is true of naso-pharyngeal catarrh.

2. In affections of the anterior nares and pharynx let operative treatment only be employed, if it is indicated on rhinologic and laryngologic grounds, apart from the aural condidition. It is quite probable that very marked obstruction of the anterior nares may cause catarrh of the naso-pharynx and Eustachian tubes; but in this case the obstruction will be so marked as to warrant interference for other reasons.

Now the above sentences represent the views I have held and expressed for many years, and I have so far seen no reason whatever to modify them, although I shall now venture to amplify them as shortly as possible.

First, then, with regard to the question of adenoids, it will be observed that I consider they should be removed in all cases where the middle ear affection is of a catarrhal nature. I have repeatedly pointed out that a relatively small amount of adenoid tissue may produce a very decided effect upon the hearing, provided it be so placed as to press upon the Eustachian tubes. Frequently enough it causes no other symptoms. On rhinoscopic examination, it may be seen wedged, as it were, between the tubal orifices and reaching right up to them. In these cases, I fancy some definite effect is exercised upon the circulation of the middle ear. At least, this is the conclusion I have come to from the following facts:

1. We often meet with a much larger amount of adenoid tissue, not lying close up to the tubes, but occupying more the middle of the naso-pharynx, which causes no ear symptoms whatever.
2. After removal of adenoid tissue causing deafness with marked indrawing of the tympanic membranes, the hearing often becomes good, but the membranes frequently remain indrawn.

As you all know, there is another variety of chronic non-suppurative middle-ear disease which is not catarrhal, I refer to sclerosis. Here we have no indrawing of the membrane, which may indeed be indisguishable from the normal, but which sometimes shows a delicate flamingo tint. It is unnecessary at present to dwell upon the characteristics of one of the commonest and at the same time most intractable affections the aurist is called upon to treat. It is perfectly well known that in many of these cases the patient's hearing is made worse by anything which disturbs the general tone, notably by loss of blood, fatigue and nervous shock. This form of ear disease is more common in adults than in children, but it does occur in the latter. If the youthful victim of sclerosis be affected with adenoids, I think the propriety of operating is a question upon which divergent views may legitimately be held. Of course, we meet with a certain number of cases in which middle-ear catarrh and sclerosis coexist, but the latter also exists in childhood and youth in a predominating and even a perfectly pure form. In such cases I think the operator will often be disappointed in the result and the relatives frequently more than disappointed. To give an illustrative case. Some years ago

I saw a young girl with progressive deafness, the membranes were little if at all altered in position, and showed the delicate flamingo shade which is of such unfavorable prognostic significance. She had also some adenoids, not however in contact with the Eustachian orifices, and to which I fortunately called her medical advisers attention. She did not improve in my hands, went to London, was operated upon, and, I understand has not been benefited. In this case I deliberately gave it as my opinion that no good was to be expected from operating and that harm might possibly result. The sequel, so far as I have been able to learn the facts, proved me right in this instance.

We next come to the question of nasal operations other than for the removal of adenoids. It will be within the recollection of those present that toward the end of last year Sir Felix Semon published two very remarkable lectures on the Principles of Local Treatment in Diseases of the Upper Air Passages.* Many abuses were touched upon, and among others the frequency of nasal operations on patients who had no nasal symptoms, but who suffered from middle-ear sclerosis, was justly condemned. Sir Felix called attention to the relative rarity of deafness as an effect of nasal obstruction, such as occurs in many cases of nasal polypus. This is a fact to which I had more than once previously alluded, and I think all experienced aurists will agree with Sir Felix Semon and myself on this point. Moreover, when deafness does occur, it is usually of a purely catarrhal character, sometimes associated with free exudation in the middle ear. It will be within the recollection of many present that these striking lectures were followed by a considerable amount of correspondence. Here it would be out of place to consider this, excepting so far as it relates to middle-ear disease. In the *British Medical Journal* of November 30th, 1901, Dr. Edward Law practically expressed his agreement with the views of the lecturer, as did also Dr. Milligan,† and not a single dissentient voice was raised among otologists. On December 14, 1901, the editor of the *British Medical Journal* was good enough to publish a letter from myself. I am not so egotistical as to believe that it is more worth quoting than the contributions of others, but my excuse for doing so lies in the fact that I propose to found my subsequent argument in some degree upon the absence of any replies to the challenge contained in it. The passage to which I desire to call your attention to is as follows:

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*British Medical Journal. Nov. 2nd. 1901.

†Op. cit. December 14, 1901.

We have heard generalizations as to the benefits of nasal surgery in obstinate ear cases, but we have rarely, if ever, had details. For these I therefore venture to ask with a mind perfectly open to conviction. I would accordingly propose that some of the many who seem to put their trust in attacking the nasal passages for relief of deafness should give information on the following points with regard to their cases:

1. The appearances of the tympanic membrane.
2. The hearing distance as observed at first visit.
3. The effect upon hearing distance produced by successful inflation, either by means of Politzer's bag alone, or by way of the Eustachian catheter.
4. The duration of any improvement so produced.
5. If such improvement is produced, of course inflation ought to be continued until no further benefit results. Has, under these circumstances, additional improvement followed a nasal operation?
6. Of course it is presumed that the hearing for bone conduction and high notes has been tested—with what result?
7. What was the nature of the nasal operation?

I must apologize for taking up so much of your space, but answers to the above queries would tend to convert those who are now sceptics or to place them in a stronger position. If no such answers are forthcoming, then I fear that we must conclude that a vast amount of nasal operating has been done with no result, and we may consider, without injustice, that those who are its advocates for the cure of otherwise incurable ear disease have no case.

Now it so happens that I have operated on numerous noses for nasal symptoms, and that I have examined many cases of chronic deafness due to middle-ear catarrh and to sclerosis respectively. I had always been prepared to assume the possibility of marked improvement in advanced chronic catarrhal deafness from the removal of nasal obstruction, although I have not had much evidence of it in my own practice. The failure of any of the numerous school of nasal operators for ear disease to respond to my challenge, I must freely confess, has rather shaken my remnant of belief just referred to. At the same time I am still prepared to justify nasal operations undertaken for the removal of an obstructing lesion in patients who suffer from middle-ear catarrh. Please mark, however, that I mean definite obstruction, and that by definite obstruction I understand a condition which is of sufficient importance to give the patient discomfort referred to the proper quarter, that is, the nose. I am, however, not prepared to justify operations either upon the septum or turbinated bodies in those cases where, although there may be slight irregularity of the one or a trace of hypertrophy of the other, the patient in answer to leading questions denies any uneasiness referable to his nose or nasal respiration. In sclerosis of the middle ear, uncomplicated with catarrh, I feel practically certain that we can never have improvement from any operation performed upon the upper air passages; but even here I am prepared to admit that the existence of the middle-ear disease need not necessarily be a contra-indication if the nasal obstruction be causing much inconvenience. It is, however, well to bear in mind that any great nervous shock, more particularly if associated with much loss of blood, may increase the aural trouble.

To return to the challenge contained in my letter above referred to, the fact that not a single writer was found prepared to give even one carefully observed case of improvement following and due to nasal operations other than the removal of adenoids, tends to produce a most disagreeable impression. I hardly like to suggest that it has made me doubt the accuracy, ability, and reasoning powers of a section of those whom I should wish to respect and to think well of. Yet, what is one to believe? I know—you all know—that an immense number of patients, the victims of incurable middle-ear disease, have operations performed with a view to curing their deafness. In such cases the nasal passages are often sufficiently pervious so far as the patient's comfort is concerned, and the Eustachian tubes are frequently open. The middle-ear is the seat of the fibroid or osseous changes, and in sclerosis the labyrinthine capsule may be affected as well.

The question must naturally arise as to what possible effect the removal of a small septal spur or a slightly enlarged turbinated can have upon the middle-ear condition, whether the latter be the result of sclerosis or catarrh. In view of the failure of the advocates of such methods of treating ear disease to come forward in answer to the strictures passed by Sir Felix Simon and others, I am driven to assume that no one wishes to confess himself an upholder of this doctrine. It may very well be asked of me why I pass strictures upon a course of action which no one defends. My answer is simply that I do so because I have reason to believe that a very considerable number of patients have their noses operated upon with a view to curing what every sensible aurist ought to know to be (so far as present knowledge goes) an incurable form of deafness.

Now, I do not wish to make any charges against those who differ from me, but I should at the same time like to impress upon them that they ought to have the courage of their convictions. Further, they ought to be able to show some reason for the faith that is in them. If they cannot do so then I have no hesitation in stating that, to put it mildly, they allow themselves to remain in a very equivocal position.

Again, I may be met with the charge of tilting at windmills; but if there be any one bold enough to make it, I fear it merely indicates a limited experience on his part, provided he practices in Great Britain. What is the usual history of the victim of middle-ear sclerosis after he has left an adviser who has informed him accurately as to his condition and prospects? He very naturally wishes to have a second opinion. It may be that he consults a gentleman with strong views as to the importance of nasal treatment, and whose ideal of what a normal nose should be is high. It matters not that he has no nasal symptoms, it matters not if the Eustachian tubes be pervious. If only there be a little hypertrophy of the mucous membrane or a trifling irregularity of the septum, it is enough. A nasal operation is performed. Sometimes it is to produce great benefit, on other occasions it is to be the last resort and may do good, while sometimes there is regret expressed that the patient did not come earlier, when the malady might have been arrested. I have now been long enough in practice to have heard the history of many such cases; sometimes I had examined them years before, given an unfavorable prognosis and advised as to treatment. I am sure the gentlemen who treated them would not always be gratified to hear their expressions of opinion. Of course, I know as a general rule views expressed by patients are not founded upon a proper scientific basis, and therefore valueless. Still, when a troublesome operation has been performed, when the hopes of improvement held out to justify it have been shattered, when previously an opinion had been given that no operation was required, we must excuse some degree of dissatisfaction.

But perhaps some of us who are inclined to protest against nasal operations—except for cure of obvious nasal obstruction—as a method of treating middle-ear sclerosis are wrong. If we be wrong, then it is the duty of those who have achieved results which confute our views to publish them. I have discussed this matter before and I know full well how skillfully the main issue can be put aside; platitudes may be made to cover much. Thus a gentleman may get up and defend his position by the statement that the cure of middle-ear disease by nasal surgery is so generally admitted that he thinks it quite unnecessary to give concrete examples. Another who practices as a rhinologist, may tell how he has produced so much benefit to the hearing of his *clientele* that against his wish, he has acquired a large practice in ear diseases. Yet a third will, perhaps, speak of latent obstruction and negative pressure, which like certain terms in metaphysics are difficult to understand in combination. The third hypothetical debater generally leads to the fourth. Here we have the calm assumption that rhinology is a thing by itself, and that only a privileged few can fathom the inexplicable something which is necessary for its comprehension. It may be that what has been revealed to the babes and sucklings has been hidden from the wise and prudent. The analogy may be carried a little further. To certain theologians logic is anathema; to some rhinologists it seems to be the same.

Now let us turn for a moment, in conclusion, to the indications for nasal operations which appear to me legitimate.

I have already referred to adenoids; it is obvious that, where a tumor of another kind exists in the naso-pharynx, it ought to be removed if possible, whether the patient be deaf or not. Still, keeping to the parts which are examined by posterior rhinoscopy, any obstructing diaphragm should be attacked. Hypertrophied posterior ends of the turbinated may cause considerable discomfort. I have sometimes thought too that they may definitely irritate the region in the neighborhood of the Eustachian tubes. Indeed, I think that some really definite evidence to this effect has once been published, but my memory does not allow me to say whether cases have been recorded in which removal of the hypertrophied extremities was demonstrated to have done more than could be accomplished by inflation, etc. Turning now to the parts accessible by anterior rhinoscopy, marked nasal obstruction, whether due to the septum or hypertrophy of the turbinated mucosa—if bilateral—requires to be dealt with on general grounds. When unilateral, it depends upon circumstances whether an operation should be undertaken, and the chief of these circumstances is the amount of discomfort experienced by the patient. These, be it observed, are all common sense indications, which would apply to persons with perfect hearing as well as to the deaf. A question of some interest is whether so-called negative pressure occurs frequently in the naso-pharynx in presence of very marked nasal obstruction. I think that where it does occur there can be no doubt that posterior rhinoscopy will reveal diffuse congestion. The last-named combination associated with catarrhal middle-ear disease would, I think, justify the operation, but it would also cause such symptoms as to give the patient very appreciable discomfort. There is a different class of cases which should not be put in the same category. I refer to persons who have what may be called for want of a better name a catarrhal tendency of the upper respiratory tract. The whole region from just within the nasal orifices to the larynx and even trachea is congested, and there is hypersecretion. Here if there be marked nasal obstruction, it will be proper to operate, but if there be only a moderate degree of enlargement of the turbinated, or a small amount of irregularity of the septum, I very much doubt whether anything can be expected from surgical interference, even if the condition be associated with middle-ear catarrh. I have purposely refrained from reference to empyema of the accessory cavities, although here operation is sometimes required before inflation can be safely begun.

I have thus freely expressed my views because it appears right that the position of those who object to promiscuous nasal operating for ear disease should be clearly understood.

I shall be willing to reconsider the whole matter if any one will adduce cases which have been carefully observed, and in which such careful observation goes to prove that nasal operations (as distinguished from naso-pharyngeal) *per se* produced benefit. I do not refer to subacute middle-ear catarrh, but to chronic deafness due either to advanced catarrh or sclerosis. We know that in such case the prognosis depends largely on the effect of inflation. I would ask for cases in which nasal operations alone have produced distinct imrovement in hearing power after other remedies (including inflation) have definitely failed. If such proof cannot be produced, nasal operating, independent of interference or the relief of nasal symptoms, stands condemned.

LXIX.

THE AIMS AND LIMITATIONS OF INTRANASAL SURGICAL PROCEDURES IN THE TREATMENT OF CHRONIC NON-SUPPURATIVE MIDDLE-EAR DISEASE.

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The intimate anatomic relations which exist between the naso-pharynx, the Eustachian tubes, and the nasal cavities afford a ready explanation of the frequency with which ear disease is found to be associated with affections of these parts. This is more particularly the case when such affections cause an interference with the due ventilation of tympanum through the Eustachian tubes, or when they form a starting-point for the extension of catarrh through the tubes to the tympanum.

Of late years considerable attention has been directed toward these points with much advantage to treatment. But, as is always the case in new departures, there is a certain tendency to overrate the value of such treatment, and thus lead some over-zealous enthusiasts to operate in every case of deviation from the normal without sufficiently considering whether any benefit to the ear can possibly result from operative interference. It is well, therefore, that this subject should receive our most careful attention and consideration; and in order to discuss the problem systematically let me begin by recapitulating the various forms of non-suppurative diseases of the middle-ear.

In the present state of our knowledge I think it will be most convenient to group these into the following classes:

1. Chronic middle-ear catarrh and its results.
2. Sclerosis.
3. Intratympanic adhesions from acute and subacute nonsuppurative inflammation.

4. Mixed cases of the above.

1. In the first of these conditions—namely, chronic and middle-ear catarrh—the establishment of free nasal breathing and the removal of any cause of irritation of the nasal mucous membrane are two most important points in treatment. The removal of nasal stenosis will, as a rule, be best accomplished by surgical interference, such as by removal of nasal polypi, of hypertrophy of the inferior or middle turbinals, or spurs and deflections of the septum.

(*a*) Nasal polypi must always be taken away, not only on account of their producing stenosis, but also because they constitute a source of irritation of the mucous membrane.

(*b*) True hypertrophy of the posterior ends of the inferior turbinals almost invariably calls for surgical interference on account of their close proximity to the Eustachian tubes.

(*c*) Hypertrophy of the rest of the inferior and of the middle turbinals requires to be operated upon whenever there is any considerable stenosis, or where this condition produces irritation of the mucous membrane.

(*d*) Spurs and excessive deflections call for operation whenever stenosis is produced therefrom; and, even though there may not be any sufficient obstruction to the nasal breathing to justify such treatment, yet in cases where spurs or deflections are causing local irritation of the mucous membrane these should be removed.

There is scarcely any need to say that foreign bodies, including rhinoliths, being sources of excessive irritation, must be taken away. And, finally, a spur or deflection may occasionally need to be operated upon in order to free the passage for the introduction of the Eustachian catheter.

2. When we come to the treatment of sclerosis, a condition which I firmly believe, as insisted upon by Politzer, to be the result of an osseous change in the bony capsule which encloses the internal ear, I wish to say most emphatically that no operation on the nose can have the least effect, except perhaps that temporary benefit to the hearing power which has been noted occasionally to follow from depletion through the hemorrhage. In a pure case of sclerosis there is no catarrh, and any operation on a deflection or

on a spur which does not seriously affect the nasal breathing is, in my judgment, absolutely uncalled for.

The question of removing nasal polypi and turbinal hypertrophies purely on their own account is a different matter altogether, and need hardly be considered in this connection, as they are rarely met with in cases of pure sclerosis.

3. When the midle-ear affection has arisen from adhesions through acute, or subacute, non-suppurative inflammation of the tympanum, operative interference on the nose is useless, for the damage has been already done and, practically, we find that it cannot be undone, though in a few rare cases some improvement can be gained by operating on the tympanum itself.

4. In the last group, that of mixed classes where the first, the true, catarrh is combined with either of the other two, the question of operation on the nasal cavities must be determined on the same lines as those for the simple catarrhal division.

To sum up: Intranasal surgical procedure in the treatment of chronic non-suppurative middle-ear disease should be limited to those cases in which the nasal defects are producing substantial stenosis, or such irritation of the mucous membrane as does affect—or, if extended, will affect—the Eustachian tubes; and therefore, in sclerosis, operations on the nasal cavities are not only uncalled for, but they are absolutely useless.

Discussion.

F. Rohrer, M. D., Zurich. My confreres, Dr. McBride and Dr. Urban Pritchard, have given such a clear and profound explanation of the subject that I will be very brief. I am in full accordance with my two colleagues who have just spoken, but will give you briefly my own opinions. If my views are different from others I hope, at any rate, you will under no circumstances accuse me of being the "advocatus diaboli." Intranasal surgical procedures are indicated by two chief reasons. The first is dependent upon the function of the nose; the second on the function of the ear, and this is nearly in every case related to the first. We often can find pathologic changes in the nose which demand surgical treatment, without any accompanying changes in the ears. If, however, disease of the middle-ear requires treatment of the nose, surely *ipso facto* the nose itself in such cases requires energetic surgical treatment on its own account, due to its respiratory function. This fact is clear, because the majority of non-suppurative middle-ear diseases proceed from the nsso-pharynx along the Eustachian tube either "per continuitatem" or "per contiguitatem." In other cases we see the same degenerative process going on at the same time in the mucous membrane of the middle-ear, Eustachian tube, and naso-pharynx. These cases are due to a "tropho-neurosis," and are known under the collective noun of "sclerosis." All chronic non-suppurative middle-ear diseases demand a careful examination of the nose, and treatment of this organ often causes a decided amelioration of the hearing, a diminution of the noises, and disappearance of the feeling of oppression. Surgical procedure in the nose is necessary if the ventilation of the nasal and pharyngeal cavities is abnormal. It can be too great or too small; it can be obstructed by neoplasms, hypertrophies, excrescences, exostoses, hyperostoses, synostoses; it can be affected by ulcerative pathological processes under the influence of an infectious dyscrasia or diathesis. Deviations of the septum, hypertrophies, papillomata, polypi in the different regions, adenoid vegetations, rhinoliths, foreign bodies all demand surgical procedure, and all can be associated with non-suppurative middle-ear disease. But I am fully aware that one must exercise care in such operations. Occasionally one gets acute inflammation of the middle-ear after surgical procedure, due to infection through the naso-pharynx and Eustachian tube; so when one operates one must remember that harm as well as good can be done.

Dr. Dundas Grant, London, considered it a good practical rule that operations should not be performed on the nose on account of chronic non-suppurative disease of the middle-ear, unless they were called for on account of the nasal obstruction as such; he was of the opinion that he had seen such affections of the middle-ear relieved by removal of nasal obstruction. He was thus in agreement with Dr. Urban Pritchard. He recalled a case (which he had narrated in the discussion on a similar subject at the British Medical Association meeting at Ipswich) in which the removal of a cartilaginous outgrowth from the left side of the septum on account of obstruction of that nostril, was followed by restoration of hearing in the left ear, which, although the patient had not complained of it at the time to Dr. Grant, he stated to have been deaf up till the time of the operation. Dr. Grant had more recently had a case in which the middle-ear catarrh was accompanied by the most intense vertigo and disturbance of equilibrium. This was invariably relieved for the time by the passage of the Eustachian catheter, but no lasting relief was obtained until the obstruction in the right nostril was removed by resection of the anterior part of the inferior turbinal; the patient recovered his stability of equilibrium to such an extent that for the first time in his recollection he was able to go through St. Gothard's tunnel without inconvenience. Dr. Grant expressed two cautions with regard to the removal of nasal obstructions; the first was that there existed such a condition as subjective nasal obstruction in which the patient complained of such being present, although the nasal passages were really free. This occurrence might help to entrap the surgeon into performing operations on the nose. The other was that oblique ascending outgrowths from the septum might look very formidable to the eye, as if calling for immediate removal, but on account of their direction they not only did not impede the entrance of air, but they possibly rather favored it, by directing it upward and backward. In regard to their offering difficulties in the introduction of the Eustachian catheter, he directed attention to his remarks on the subject in a paper presented at the last meeting of the Association, in which he indicated means by which various obstructions in the nose might be "dodged" by the catheter. He was convinced that a great deal of misunderstanding and waste of time in discussion had arisen from the fact that some of those who took part had erroneous ideas as to what was meant by sclerosis of the middle-ear. He was sure that no one would knowingly perform operations on the nose for the cure or prevention of sclerosis of the middle-ear, who really understood the nature of the affection. In some cases apparent benefit was obtained; either because the sclerosis was accompanied by a congestion of the labyrinth, which was relieved by the hemorrhage, or there was a neurotic element, and counter-irritation resulting from the operation produced an effect on the nervous system which was sometimes an injurious one—a kind of traumatic hysterical paresis; and in others there was the condition of anemia rather than congestion, and the hemorrhage made it worse. In reply to Dr. McBride's suggestion that his requoting the case which he narrated two years ago at Ipswich, indicated that he had within these two years seen no cases of chronic catarrh of the middle-ear benefited by intranasal operation, Dr. Grant protested against such an inference being drawn; he quoted the case because it was remarkable in the fact that owing to the unusual fact of the patient not having complained of his dullness of hearing until the treatment (nothing whatever except the removal of the nasal obstruction) had been carried out and the improvement noticed. Naturally if the patient had complained of the dullness of hearing, the usual inflation or catheterization would have been practiced, and the case as pure evidence of the beneficial effect of intranasal operation would have lost its value as an unintentional experiment.

Dr. Lambert Lack, London, said that having listened to this discussion there seemed to him to be very little difference between the two parties when the differences were reduced to words, but there was a general impression that there was a very great difference in practice. Much depended upon the speaker's own opinion as to what amounted to real nasal obstruction. To try to give a more definite turn to the discussion, Dr. Lack advanced the dictum that the nasal obstruction per se was never a cause of deafness or ear disease. He urged the following reasons.

1. Numerous cases were met with in which nasal obstruction, partial or complete, existed, and had existed for many years with normal hearing and normal ears.

(*a*) Stenosis of anterior nares due to lupus or syphilis. He had seen at least thirty instances of this condition during the past year, and it was the greatest rarity to observe any impairment of hearing or indrawing of the drums. The nasal obstruction in these cases was of all degrees from partial to complete.

(*b*) For many years past he had treated all cases of ozena (the total number of which he estimated at nearly 100) by packing the nose with strips of gauze so as to produce complete nasal obstruction. This had never produced deafness; on the contrary cases of pre-existing deafness had improved under this treatment.

(*c*) In nasal polypi, even in children, deafness was notoriously rare. The same held true of nasal obstruction due to deflected septum or spurs.

2. Growths in the postnasal space, for example, adenoids, caused deafness, but here there was nasal obstruction or negative pressure at the orifices of the Eustachian tubes, the plane of the slight obstruction produced by adenoids being posterior to the orifices of the tubes.

3. In cases of deafness with indrawn drum, associated with nasal obstruction, a certain amount of Eustachian obstruction would invariably be present, and he asked why should the negative pressure existing in the postnasal space exert its effect on the drum when the tube was obstructed and not when it was patent, and how was it that the greater the obstruction of the tube the more marked the indrawing of the drum.

Surely Eustachian catarrh and obstruction with or without more or less middle-ear catarrh was the cause of the ear trouble in these cases.

4. To the objection that nasal obstruction only exerted its full effect upon the ear in children in whom the instincts of nasal respiration were so strong, he replied that children with simple nasal stenosis were usually not deaf. Children with adenoids and also adults were often deaf, but only when the tubes were blocked.

5. The objection that the improvement which followed operations on adenoids could only be explained on the theory that a negative pressure was abolished was equivalent to saying that a theory set up to explain one fact was contradicted by other facts—so much the worse for the other facts. He suggested that theory might be wrong, and that the improvement following adenoid operations might be better explained by the disappearance of Eustachian obstruction. The immediate improvement so often noted depended on hemorrhage, which produced rapid opening of the tubes, and the ultimate improvement de-

pended on complete disappearance of the Eustachian catarrh.

He did not look forward to the immediate overthrow of this theory of negative pressure which had lived long enough to become venerable, but hoped to show the very slender grounds upon which it rested, namely, the fact that a clear case could not be produced to show that it was ever the one factor present, and that in every case Eustachian obstruction rather than negative pressure was the cause of indrawn drums.

Dr. Scanes Spicer, London, thought there was a general consensus of opinion that operations in the nose should not be done in advanced cases of catarrhal hyperplastic disease with adhesions, or in sclerosis, or in labyrinthine disease with the idea or promise of curing deafness. He had for many years made this quite clear to every patient. Yet he strongly advocated the rectification of nasal stenosis in the early stages of catarrhal otitis, especially when recurrent, and before permanent hyperplasia and adhesions had ensued. Also there were mixed cases in which catarrhal processes were superadded to sclerotic and labyrinthine disease, and in which the patients should not be refused the chances of anything that would reduce or arrest the catarrhal process, and so save what hearing remained, though it should be made quite clear that nothing could be guaranteed as to improving the deafness. Dr. McBride had suggested certain tests being applied before submitting a deaf patient to nasal operation. The speaker did not regard these tests of much practical value, because in the doubtful cases it was not the degree of deafness to watch or tuning fork, but (1) whether the hearing for conversation was worse with a head cold, (2) whether there were frequent and recurrent or chronic head colds, (3) if there were evidences of nasal stenosis shown by alar collapse on inspiration—that afforded the true criteria for nasal interference.

It was the greatest fallacy to assume that there was no substantial stenosis or definite obstruction without some "gross nasal lesion." In many very obstructed noses there was absolutely no "gross nasal lesion." A high degree of stenosis was often due to several factors, trifling in themselves, producing by summation a great effect. This stunting of the nasal framework from the disused nose during growth, arrested evolution of nostrils, alar collapse, rhinitis, erectile tumefaction, edema, spurs, deflections. deviations and dislocations, adenoids, enlarged tonsils, and other conditions, might in varying combinations and degrees form a high degree of nasal obstruction, and, though any one of these factors might be slight in any given case, and no "gross nasal lesions" present, there might nevertheless be extreme stenosis. It was the fact of obstruction that had to be determined in relation to catarrhal otitis, and that obstruction should be rectified if it was still capable of doing further harm to the ear or otherwise to the individual. He thought that the opponents of the nasal stenosis theory were singularly deficient in logic in this matter, for they had no consistent explanation to offer as to how the removal of their "gross nasal lesions" improved catarrhal deafness. In fact, removing "gross nasal lesions" had no effect upon catarrhal deafness unless such lesions caused obstruction, and if the operator did not remedy obstruction, his nasal operation was futile as to catarrhal ear disease. It must, therefore, be inferred that the action of the opponents of the nasal stenosis theory in attacking nasal lesions in catarrhal otitis was merely empirical, and not based on any rational principle, in contradistinction to that of the rhinologists; while the former were unable to offer any alternative theory to that of nasal stenosis and negative pressure, which, indeed, harmonized with all the facts.

Modern rhinology explained how nasal stenosis caused excessive fluctuations of air tension in the nose and naso-pharynx; how these changes of air tension (especially negative pressure) caused chronic hyperemia and edema of all vascular tissues behind the obstruction; how in these latter changes the tissues of the pharyngeal end of the Eustachian tube shared; and how this vascular edematous swelling caused closing of the Eustachian tube. Given a chronically closed tube, it would be conceded generally that exhaustion-otitis and hyperplasia followed. Catarrhal rhinitis and nasal trumatisms were probably the commonest prime exciters of stenosis; but, however originating, the corollary of stenosis was excessive fluctuation of air tension in the nose and naso-pharynx with every breath. The incessant action of this negative pressure or suction force on the walls of the intranasal vessels gradually broke down their vasomotor control, and caused such hyperemia and edema of the pharyngeal mouth of the Eustachian tube as to close it up. If there were frequent colds in the head, the rhinitis, and so the stenosis, were increased and perpetuated, until there ensued in time a hyperplastic rhinitis, a hyperplastic salpingitis with occlusion of the ostium and lumen of the tube and a hyperplastic otitis media with adhesions and ankyloses.

With reference to the question which has been asked as to what was substantial stenosis or definite obstruction, the following facts should be borne in mind: (1) Nasal passages which were ample in an infant would, if development were arrested from disuse, be insufficient or stenotic for the same child at 6. (2) Nasal channels which would be ample in calibre for a subject weighing 6 st., would be totally insufficient for a subject of 12 st. (3) Nasal channels which admitted enough air during easy breathing at rest might be quite insufficient when the same subject was doing active work and forced breathing. (4) Nasal channels, ample by day, might, from redistribution of fluids at night, be totally obstructed, and compel mouth breathing.

Yet noses were emphatically declared to be "absolutely normal" by those ignorant of rhinology, because they did not find "gross nasal lesions," such as adenoids and polypi, which alone they were accustomed to deal with empirically; whereas the great factor of stenosis or obstruction was overlooked, allowed to run riot and do all the damage of which it was capable, until its effects culminated, finally and hopelessly, in a contracting hyperplastic otitis, with adhesions and incurable deafness.

[The speaker handed a round photographs of his apparatus and the tracings taken, to demonstrate conditions of air tension in the nose and naso-pharynx. The apparatus consisted of a manometer, Marey's tambour, kymograph, and pressure bag. These charts showed the degree of normal fluctuations of air tension in a series of normal nose breathers. They next showed how those fluctuations were increased in obstruction, and that the increase was *pari passu* with increasing obstruction, indeed, that stenosis easily trebled and quadrupled the normal fluctuations of air tension. They also showed that the negative pressure of inspiration in stenosis not only exceeded the normal, but also increased disproportionately to the increase of positive pressure of expiration. A further very important series of curves showed the fact that when the nasal stenosis was so extreme as to compel mouth breathing there were practically no fluctuations of pressure in the naso-pharynx, therefore no negative pressure to cause hyperemia and edema of the Eustachian tube, and hence a complete explanation of the fact that had been so triumphantly and frequently paraded by the opponents of the nasal stenosis theory of catarrhal otitis, that in congenital atresia of the nares and extreme cases of obstruction from polypi or other causes there was sometimes no catarrhal deafness. The charts also showed that fluctuations of air tension were increased (1) by approximation of the ala to the septum, as in alar collapse; (2) by rhinitis; (3) by septal deviation. Lastly, the tracing proved that when one side of the nose was obstructed by rhinitis or septal deviation the fluctuations of pressure on that side were greater than on the opposite side and hence would explain on the stenosis theory why the catarrhal deafness was usually worse on the side of the obstructed nose.]

Mr. E. Cresswell Baber, Brighton, agreed on the whole with the indication for intranasal surgery in chronic non-suppurative middle-ear disease laid down by Dr. McBride and Dr. Urban Pritchard. He thought, however that in cases of chronic non-suppurative middle-ear disease in children, in which inflation did not improve the hearing, adenoids, if present, should be removed, but a correspondingly unfavorable prognosis must be given. He had not met with so many cases in which operations in the nasal cavities had been performed in sclerosis of the middle-ear as some members seemed to have seen. He found that for practical purposes it was convenient to divide the cases under consideration into classes: (1) Those in which inflation improved the hearing power. In these nasal obstruction might be removed with benefit to the ear. (2) Cases in which the hearing did not improve by inflation. In these, operations on the nasal cavities was not to be recommended for improving the hearing. The most it could do which itself was doubtful, was to prevent the deafness from increasing. By making use of the inflation test he had avoided considerable disappointment in the treatment of these cases. A third class of cases existed in which it might be necessary to remove synechiae or other obstruction in order to obtain access to the Eustachian tubes to treat the ear trouble. In speaking of nasal obstruction he referred to real obstruction only, in which the patient was unable to breathe comfortably through the two nostrils with the mouth closed. He suggested that Dr. Spicer should publish the observations which he had brought before the meeting.

Mr. T. Mark Hovell, London, said that he considered that the patency or otherwise of the Eustachian tube to Valsalva's inflation gave the key to the answer as to whether the removal of nasal obstruction was likely to benefit the condition of the ear in case of deafness. If the Eustachian tubes were closed to Valsalva's inflation the removal of the nasal obstruction should be undertaken as part of aural treatment. He considered it immaterial whether the airway through the nostrils was straight or tortuous; if free air-way existed that was sufficent. In any case of nasal obstruction he considered that, when possible, a free airway should be obtained irrespective of the existence of ear disease.

Sir Felix Semon, London, assured the meeting of the reality of his statement with regard to the frequency with which he saw intranasal operation preformed in cases of pure, incomplete, and often enough unilateral nasal obstruction in cases of deafness, tinnitus, etc., whilst the naso-pharyngeal cavity was perfectly normal. He was certainly not an opponent to intranasal operations when there were legitimate grounds for believing that catarrhal processes actually extended from the nose through the naso-pharyngeal cavity, but he would continue strongly to oppose operations in such cases as he had mentioned first. With regard to Dr. Spicer's experiments, he hoped they would be published in full, when he would study them attentively. He confessed he had not been able to follow Dr. Spicer's arguments sufficiently, but whatever his theories were, the view that nasal stenosis, pure and simple, could have that unfavorable influences upon the ear which was ascribed to it by Dr. Spicer was negatived by the results of practical experience, as in cases of multiple nasal polypi or in congenital diaphragms of both choanae, and as now futher evidenced by the negative result—so far as the production of deafness was concerned—of Dr. Lambert Lack's packing of the nose in cases of ozena. The speaker concluded by proposing that a committee should be nominated in which the different sides should be represented, and which should practically investigate, on the basis of Dr. McBride's challenge, the aims and limitations of intranasal operations in chronic middle-ear disease. At a later stage of the proceedings he changed the venue of this proposal, which met with general approval, by promising to bring it before the Laryngological Society of London for conjoint action with the Otological Society.

Dr. Herbert Tilley, London, thought it waa a matter for congratulation that all the speakers agreed that in cases of sclerosis of the middle ear no intranasal operations should be undertaken with a view to improve the hearing; such a unanimity of opinion was not present at the Ipswich meeting two years ago when the same subject was discussed, and he hoped that the future practice of otology would truly reflect the opinion which had been expressed in the matter that day. Personally he could not recall to mind a single case of sclerosis of the middle ear which had been in the least benefited by intranasal treatment. Whilst holding a strong view of the matter, he was equally certain that certain cases of catharral deafness were benefited by removal of marked nasal obstruction which assisted in keeping up a catarrh of the nasal mucosa. A large nasal crest and anterior end of an inferior turbinal were shown which were removed from a deaf patient with very great and permanent benefit to his hearing. The speaker agreed with Mr. Baber that the cases which were likely to improve by intranasal treatment were those in which the degree of deafness varied from time to time and in which temporary relief was produced by inflation of the tympanum. In such instances various degrees of moist catarrh were present. He congratulated Dr. Spicer on his endeavor to prove the presence and importance of "negative pressure" as a prime factor in the causation of catarrhal deafness, but was bound to confess the laboratory experiments scarcely corresponded to the condition of things in life, for example, presuming that there was a certain degree of obstruction to nasal respiration and that in the experiment this produced a certain movement in the manometric column, which, according to Dr. Spicer, indicated a sucking or dragging force on the nasal mucosa; this force would be infinitely less in degree in real life, because the patient would immediately open the mouth and so reduce intranasal negative pressure to practically nothing.

Mr. C. H. Fagge, London, said that simple nasal obstruction was so often absolute for long periods without deafness, that it was difficult to believe that nasal obstruction did cause deafness without naso-pharyngeal complication, and therefore no operation on the nose should be lightly undertaken to cure deafness when the naso-pharynx was normal. He confessed he had learnt nothing from a practical point of view from the previous speakers, as regarded the amount of nasal obstruction demanding operations. He could not understand why some of the previous speakers had seen no cases in which extensive intranasal operations had been undertaken in cases of sclerosis and extreme chronic catarrh, because even in his small experience he had, much to his regret, seen a proportionately large number of such cases. He failed entirely to see how removal of a slight nasal obstruction, often one sided, could influence deafness. He had operated for removal of adenoids on two cases of sclerosis in children, giving a guarded prognosis, and he found that in both cases the result was very bad; in fact deafness immediately increased and for a long time did not return to the condition before operation, which result he attributed to hemorrhage acting on the general health. He was certain that the theory of causation of deafness through mechanical obstruction of the tubal orifices by adenoids was impossible, because deafness was not often seen in cases with marked adenoid masses and was extremely common in small engorged masses far removed from the tubal orifices. In all cases the process was infective, producing a naso-pharyngitis and Eustachian salpingitis. Mr. Fagge failed to understand what Dr. Dundas Grant meant by "subjective" obstruction, and asked for a definition of its pathology, for he considered that a disease which had no pathology, at least theoretical, had no existence.

Dr. Kerr Love, Glasgow, thought the issues in the discussion had been obscured by the difficulty of distinguishing sclerosis of the middle ear from catarrhal conditions and by the difficulty of defining what nasal obstruction was. Assuming that these distinctions could be made, he thought the cases under discussion might be divided into three classes:—(1) Cases of sclerosis; in these they were all agreed that operative interference was useless; (2) cases of deafness, in which no subjective feeling of obstruction was complained of, even after the patient had been told how to observe these—here he did not think operation was likely to do good; (3) cases of deafness in which both subjective and objective evidence of nasal obstruction existed. Here operation should be resorted to, and, in many cases, improvement would follow. Two practical guides in prognosis were: (1) That improvement followed the use of the inflation bag; (2) that the deafness varied with the presence or absence of cold in the head.

Dr. Adolph Bronner, Bradford, thought that intranasal operation for treatment of ear disease should only be adopted when there was catarrh of the naso-pharynx and Eustachian tube. In these cases only could any improvement be made. Of course, real intranasal obstruction should be removed for other obvious reasons. How removal of a small spur of the septum could possibly improve the hearing Dr. Bronner could not understand. It was a great pity that a unanimous opinion as to when intranasal operations were called for could not be obtained. It was extremely unpleasant that a patient on getting a second opinion should be told that an intranasal operation should have been performed long ago.

Mr. Richard Lake, F.R.C.S., had but little to add to what he had said two years ago at Ipswich. He did not consider Dr. McBride justified in his assumption that as no replies had been made in the press to his letters, thereby it was proved that no one could produce the cases asked for. For his own part he declined to enter into discussions in the public press at anybody's bidding. He also said that a more accurate knowledge of the pathology of middle-ear sclerosis had put an end to all hope of improving it by intranasal surgery, but formerly he had undoubtedly operated in such cases. He referred to a case in which draining the frontal and maxillary sinuses had been followed by improvement in the hearing.

Mr. W. H. Kelson, London, said the results of intranasal operations were apt to be disappointing if there was little or no improvement on inflation; if the patient was anemic, and with the increasing age of the patient. From their relation to the pharyngeal opening of the Eustachian tubes one would expect improvement from removal of hypertrophies of the posterior end of the inferior turbinate bodies, but this was rarely the case. In plethoric individuals who were improved by inflation good results were sometimes obtained by intranasal operation, but this was probably due to the beneficial effect of the local blood-letting.

Mr. A. L. Whitehead, Leeds, agreed entirely with Dr. McBride's conclusions, but would like to know whether a a case of sclerosis and catarrhal deafness in which there was no improvement after inflation but progressive deterioration in hearing power, would not be regarded as a suitable case for operation if nasal obstruction existed.

Dr. L. Hemington Pegler, London, felt compelled to retain an open mind upon this subject in reference to certain forms of chronic catarrhal deafness. He identified himself with the position taken up by Dr. Dundas Grant, who had just referred to a case corresponding as closely as possible in all particulars with some in his own experience. Many patients suffering from impaired hearing volunteered the assertion that they felt much improved after having had their obstructed nasal passages cleared. Doubtless these were amongst the so-called catarrhal cases, but it could scarcely be assumed that there was nothing more to be learnt in the pathology of chronic non-suppurative disease. The improvement generally referred to the hearing power for conversation, and was often difficult to measure accurately, but cases resembling those described by Drs. Grant and Tilley could not be rare in the practice of many others of those who attended hospital clinics. As Mr. Lake had remarked, these might doubtless have accepted Dr. McBride's challenge, but refrained from entering the lists through motives best known to themselves.

The President said that as the discussion had already lasted so long he would not detain the meeting by making many observations. He considered that the discussion had proved of value in that it had elicited what appeared to be the unanimous verdict of all the speakers that in genuine sclerotic catarrhal conditions of the middle-ear intranasal operations were useless and were even harmful. In chronic non-sclerotic catarrhal conditions of the tympanic mucosa, where inflation improved the patient's hearing power and where some genuine respiratory difficulty was complained of by the patient, intranasal surgical procedures were of value and at times markedly so. He welcomed the formation of a committee to investigate this important subject, and hoped that the results of the labors of such a committee would be to lay down somewhat more precise rules than at present existed for guidance in the treatment of such cases.

Dr. McBride expressed pleasure that so many of the speakers were in agreement with him. He thought it impossible to criticize Dr. Scanes Spicer's experiments until they had been published in full and there was an opportunity of carefully studying them. In reply to Dr. Dundas Grant and Mr. Cresswell Baber, he had only one word to say and that was, he urgently insisted upon the desirability of having an authoritaive pronouncement of opinion from a suitable committee, as suggested by Sir Felix Semon.

Dr. Urban Pritchard had only one point to add, Dr. McBride's reply not necessitating any official reply from him. He would like to call attention to the large proportion of cases of adenoids in which some nerve as well as middle-ear deafness was noted, and in which the benefit from operation was practically nil; in these cases congenital syphilis was present, often proved by subsequent interstitial keratitis.

LXX.

REMARKS ON CHOLESTEATOMA OF THE MIDDLE-EAR.

By Dundas Grant, M. A., M D., F. R. C. S.

SURGEON, CENTRAL LONDON EAR AND THROAT HOSPITAL.

It must have happened to all who have had much experience in otology to have met with one or two cases in which the attic of the tympanum is lying freely open, the outer wall having completely disappeared, while the cavity is entirely lined by a smooth, pearly-white membrane. Occasionally the loss of bone extends to the posterior-superior wall of the osseous meatus, leaving an opening through which a cavity much larger than the antrum, though including this, is visible, the walls being covered by the same kind of shiny, pearly-white membrane. The patient, though dull of hearing in that ear, may be free from all discomfort except the occasional accumulation of desquamative epithelial products, which are easily removed. In such cases there has generally been a history of chronic suppurative inflammation of the middle ear of several years duration, characterized by the occasional occurrence of severe headaches and the extrusion of white, macerated, skin-like formations.

The course of events in such cases has been the development of the so-called cholesteatoma, consisting essentially of a membrane lining the natural or pathologic cavity in the petrous bone, desquamating so that the cavity is filled with epidermoid scales, the central ones of which have broken down into cheesy masses containing cholesterin crystals. Under the influence of moisture or inflammation the desquamation is increased, and the cavity thereby filled and distended; the pressure causes the walls of this to give way at their weakest part, and, if as in the fortunate cases we are describing, this is the part presenting toward the tympanum and external meatus, the bone in those places is gradually eroded until the cavity is laid so freely open that there is sufficient room for the exit of the contents.

The course of formation of such a cholesteatoma appears to be as follows: As a result of a suppurative inflammation extending into the antrum and adjacent cavities, the lining membrane becomes covered with granulations similar to those on an ulcer on the surface of the body; in some cases, especially the tuberculous ones, progressive caries of bone results, and very little or no attempt at healing takes place. In the absence, however, of such a dyscrasia, the smaller bony trabeculae give way, and a comparatively large cavity remains, lined with granulation tissue. As the suppuration subsides, the edges of the perforation in the tympanic membrane may become cicatrized, and it is possible for the granulations to subside, and a return to a fairly normal mucous membrane is effected. Should, however, the perforation in the membrane be peripheral, and there is a ready continuity between the epithelium of its outer surface and the granlations on the wall of the tympanic cavity, the same changes take place on the surface of healing ulcer of the leg. The cuticular epithelium proliferates over the granulations from the periphery onward until the whole ulcer, if not too large, is covered with a cicatrix, which may be a fair substitute for skin. In the middle-ear this process has been traced, as shown by microscopic examination, to a considerable extent into the tympanic cavity; there is no reason why it should not continue through the aditus into the antrum, at first reaching only those portions of the walls of the cavity which are nearest this orifice, then gradually extending over the parietes until the whole cavity is lined with an epithelial cicatrix. Sometimes in performing the radical mastoid operation one finds the cavity in this condition. At other times, as in a case I operated on a few days ago, the part nearest the mastoid surface is filled with granulation tissue, and the shiny cholesteatoma membrane is found on the inner wall of the antrum and the portions adjacent to the aditus. Probably in this case the epidermization was gradually extending toward the remoter spaces, and in time would doubtless have eventuated in the formation of a typical cholesteatoma. Of course it would be impossible to predict whether this would be favorable or unfavorable to the patient's life, as the centrifugal pressure exerted by it might result in erosion of the bone in the direction of the lateral sinus or the other cranial contents; if the circumstances were favorable, and the *locus minoris resistentiae* was in the direction of the tympanum and external auditory meatus. the bone might give way, as in the instance I first quoted and the contents of the cavity find their way into the outer passage of the ear. The lining of the cavities thus exposed is sometimes as perfect as could be desired, and when freely exposed and kept dry by exposure to the air, the avoidance of the introduction of water and the use of alcoholic instillations, the patient's condition may be one of complete comfort and safety. The main postulate is that the opening should be sufficiently wide for the entrance of air and for the immediate escape of desquamative products. It need hardly be said that it is only in exceptional cases that this takes place spontaneously in the favorable direction, and as soon as the condition of cholesteatoma is recognized the surgeon should be ready to carry out the operation necessary for its free opening,

In the absence of such evidence of pressure as pain, vertigo, and bulging of the postero-superior wall of the meatus, he is justified in giving a trial to such dehydrating measures as the installation or injection of alcohol in the form of rectified spirit, which may at first be diluted to the extent of 50 per cent. This preliminary treatment is all the more called for, inasmuch as it is difficult, and perhaps impossible, to say beforehand how far the desquamating membrane extends into the mastoid cavities, and if this extension is very limited the necessity for operation may not arise. On the other hand, in the presence of pressure symptoms, no delay is permissible, and a free opening after the manner so well formulated by Stacke, is called for. If, when the opening has been made, it is found that the cholesteatomatous condition does not extend deeply into the cavities, but that they are filled with granulated tissue and broken-down bone, the hole should be thoroughly scraped out and suitable plastic arrangements for lining the cavity adopted. If the cavity is very small, any of the various well-known flaps may be formed, and cicatrization over the granulating surface encouraged, the rapidity of healing being in proportion to the smallness of the area which has to heal. Should the cavity be fairly large, I have no hesitation in saying that it should be lined by means of a Thiersch's skin graft, according to the technique so perfectly devised by Ballance. Even in the hands of one who is only moderately expert in the technicalities of this process, the results far surpass those obtainable without it in cavities of the same size.

In those cases, however, in which the cicatricial process has extended over the whole of the walls of the cavity, I venture to believe that we have already to hand as good a lining as we can desire, and that it is not merely a justifiable but a very desirable economy of the patients's time and tissue to preserve and make the most of the lining in question. I have in several cases put this principle into practice and found a complete healing of the parts and drying up of the discharge produced with a rapidity and ease unequalled in other cases. In such cases I content myself with gently scraping out the contents of the cholesteatomatous cavity and leaving the white shiny membrane *in situ*, swabbing it carefully but thoroughly with rectified spirit. In my last case I then insufflated a quantity of sterilized aristol, a substance recommended by Mr. Ballance for use when plugging the cavity he has lined with Thiersch grafts, applying over this a light tampon of iodoform gauze, and, after about a week, starting the installation of alcoholic drops.

In cases, and there are such, in which a shiny uniform membrane is found lining the cholesteatoma cavity, I see every reason to think that this should be preserved instead of being scraped out, as is recommended by most operators up to the present. Should the membrane be pulpy, imperfect, and not homogeneous, I am equally convinced that it is our duty to practice complete erasion and to line the cavity by transplantation of a skin graft.

Discussion.

Dr. Urban Pritchard considered that the enlargement of the antrum and mastoid cells in a typical case of cholesteatoma was chiefly due to pressure and not to ulceration of the bone, as was the case in ordinary mastoid disease. This was proved by the hardness and smoothness of the bony walls of the cavity, which was lined by a thin altered mucous membrane. At the same time he agreed that there were always spots of ulceration to be found.

Dr. McBride said that according to Habermann cholesteatoma originated from ingrowing of epidermis through a perforated membrane, and that the epidermis seemed to take on an unhealthy growth. For these reasons he deemed it inadvisable to leave the matrix.

Mr. C. H. Fagge did not agree with Dr. Dundas Grant's view that the cavity was lined with a pearly membrane. He said it never was complete, and that there was always ulceration somewhere. The membrane was a thinned-out skin growing in from the surface, and persisting within the antro-attico-tympanic cavity altered by inflammation, and was different from what had been described as the matrix, which was merely the outer layers of the cholesteatomatous mass overlying the ulcerating patches. He personally did not agree with the mechanical view of erosion of bone in cholesteatoma, as it often occurred without blockage of the external orifice, as in cases of caries with large postnasal or meatal openings. He considered it to be a chronic infective ulceration, absolutely independent of pressure.

Dr. Dundas Grant, in reply, denied that in all cases of cholesteatoma there was coexistent ulceration. In complete cases the pre-existent ulceration had healed. He had not committed himself to the opinion that the dilation of the cavity might not be in part the result of infective ulceration, but he was in favor of the view that it was mainly attributable to pressure, such as was exercised by an aneurysm when it eroded the sternum, or by cholesteomata of the external auditory meatus on the bony walls of that passage. He was glad to find Professor Pritchard's views so closely coincided with his own. He looked on cholesteatoma as a "desquamative dermatitis," the stages being the formation of a derma lining the cavity, then the inflammation of this derma resulting in desquamation and the agmination of desquamative products.

LXXI.

ON THE RELATION BETWEEN THE FORMATION OF THE AURICLE OF ANTHROPOID MONKEYS, AND CERTAIN CONGENITAL MALFORMATIONS OF THE HUMAN AURICLE.

By F. Rohrer, M. D.,

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It is three years since I had the honor of giving in your honorable Section of Otology at Portsmouth an explanation "On the law of folding of the human auricle," derived from a large series of observations of congenital anomalies of the external ear of men. In consequence of these observations I was led to compare certain congenital malformations of the human ear with the regular and normal formation of the auricle of anthropoid monkeys. The human auricle is an organ in the state of involution and degenerative metamorphosis. As I found in my examination on the relation between the function of the eye and the ear, the auricle was primarily a homologue of the eyelid, and nothing but an organ of protection for the delicate and more superficially situated parts of the middle and internal ear. At a later degree of evolution a funnel for hearing was formed by the large development of the ear folding, especially by the upper parts of the helix and antihelix. We can see it, for example, on the representatives of the solidungula, multungula, and biscula. If we look at the auricle of a horse or of a cow, and compare it with the auricle of a monkey, we find a great difference in the direction for involution of the ear-folding by the quadrumana. When we make an inquiry as to the development of the auricle of the hemisimiæ to the simiæ, and from the simiæ to the anthropoid monkeys, we find that the evolution of the auricle is from one class to the other, from the lower to the higher. Going from the quadrumana to the homo sapiens, further, we observe a progress in the regressive metamorphosis of the external ear, and the nice and delicate form of a well-formed feminine human auricle shows that this part of the organ of hearing is by Nature now more destined for elegance and beauty than an accoustical or a protective function. Atavism gives us the key to many puzzles of Nature. Under a great quantity of anomalies of formation of the human auricle I found a cartilaginous stripe which went from the crus helicis ascendens through the cymba in a rectangular direction to the point of bifurcation of the truncus anthelicis, and took origin on the upper side of the tragus on the incisura supratragica. This singular stripe was declared a supernumerary anthelix. A similar stripe is also found in the ear of monkeys, and Schwalbe described it under the designation of crista anthelicis anterior as a homologue to the crus anthelicis inferius.

I many cases I saw at the place of the above-mentioned stripe only a cartilaginous tubercle prominent from the crus helicis ascendens in the cymba, close by the incisura supratragica. What signifies this tubercle and the stripe from this point to the bifurcation of the truncus anthelicis? It is nothing else than the crista anthelicis anterior described by Schwalbe. A young colleague took this as the subject of his inaugural thesis. Gathering a satisfactory material for my pupil, I produced a series of drawings of auricles from anthropoid monkeys, and in all cases I found the crista anthelicis anterior more or less declined from the truncus anthelicis. The crus inferius anthelicis is really the continuation of the truncus anthelicis, and between the crus superius and inferius anthelicis is placed the fossa triangularis. Now we see that the stripe in the cymba, described as a congenital malformation of the human auricle, exists at the side of the crus inferius anthelicis and in rectangular direction to its origin from the truncus anthelicis traversing the cymba. But the crista anthelisis anterior takes its origin also from the upper part of the truncus anthelicis and traverses the cymba more or less declined. Therefore I conclude that the described stripe of the human auricle is a homologue of the crista anthelicis anterior, and that the latter cannot be the homologue of the crus inferius anthelicis.

It must be interpreted as a folding of the auricle in the direction from the basis of the auricle to the real point of the external ear to the tuberculum Darwini. The fact is most interesting, and shows how the law of involution is the same for the auricle of anthropoid monkeys and human auricle, and that in consequence of regressive metamorphosis the crista anthelicis anterior of monkeys' auricles by atavism appears a stripe in the cymba of human auricle by certain congenital malformations.

LXXII.

THE PROVISION IN LONDON FOR THE EDUCATION OF THE DEAF.

By Atwood Thorne, M. B.,

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I was led to make an investigation into the schools for the deaf in London because, when asked by parents, both in hospital and in private, as to the best course to pursue in reference to the education of children who were either congenitally deaf or else had from disease become too deaf to benefit by attending hearing schools, I found that I was unable to give a satisfactory answer.

I had intended in this paper to refer both to public institutions and private schools and private tuition, but as the work is not uniformly good, I have found it better to confine my remarks to public institutions only.

Rather to my surprise, I found that all schools for children profess to educate by the pure oral method (that is, by teaching lip reading and articulation), and that the method of teaching the deaf and dumb alphabet and by signs is no longer used when teaching children of any intelligence. Amongst adults who have not had the opportunity of learning lip reading, and for weaklings, signs still prevail, and in one church in London the whole service is carried on in that way.

The schools which I shall refer to in this paper are: (1) The Deaf Centres of the London School Board, (2) The Association for the Oral Instruction of the Deaf and Dumb, (3) The Royal Asylum for the Deaf and Dumb Poor, (4) The Training College for Teachers of the Deaf, (5) the Paddington Home for Deaf and Dumb Children, (6) The Jews Deaf and Dumb Home, (7) the British Asylum for Deaf and Dumb Females.

The Deaf Centres of the London School Board are for the exclusive use of London children. There are eighteen of these centres dotted over the metropolis, and they are usually close to or part of one of the Board Schools. The number of children on the roll attending these schools is 545, and the staff consists of 66 teachers.

In many cases children are not brought to the schools as early as desirable, but gradually the average age of new pupils is being lowered. What is desired is, that the deaf child should commence as early as the hearing child, and attend the whole course until he is 16. Regularity of attendance is of the utmost importance in the education of the deaf.

Great pains are taken by the School Board that all suitable cases are brought to the deaf centres. Guides are employed to bring young children from a distance, and where the education cannot otherwise be carried on the children are boarded out. These are carefully looked after by a Boarding-out Committee, each member taking charge of certain children. The pupils are, with one exception, which I will afterward refer to, taught by the "oral method," and the usual subjects of elementary education are included in the curriculum. The pupils attend the ordinary centres for wood work, cookery, and laundry work.

It will be, perhaps, convenient here to refer shortly to the method of teaching adopted, and one cannot but admire the wonderful patience of the teachers, especially in the junior classes.

When a child first comes to school, he has exercises in breathing and facial movements, so as to train the organs used in speech. He is shortly taught to imitate the teacher in making the sound of the letters "f," "th," "t," etc. This is done by carefully watching the teacher, the child being made to feel the explosive breath when these articulations are made. He also sees the part taken by the lips, tongue, teeth, etc., in forming these letters. The vowel sounds are next taught, beginning with "a" as in "father." This is often taught by placing one of the pupil's hands against the teacher's throat, the other against his own. He feels the vibration of the vocal cords, and tries to imitate it. Combinations of the sounds taught are then given—for example: "p" and "a,"="pa," "p" "a" "t"="pat." The action is then performed and the word written. Again in "t" "oo" "th"="tooth." The object is pointed out and the word written. Thus with constant practice the child recognizes that these combinations represent a certain object or action. He also learns to write the word.

This is his first step in language—the teaching of words and their meanings. Hitherto, having never heard words spoken they had no meaning to him.

The pupil is also taught to lip-read these sounds and words, and to form sentences.

It will be seen that the progress of the deaf child is necessarily slow in the beginning, but when he has acquired a good vocabulary and some proficiency in lip-reading, his progress is much more rapid.

The only exception to the oral teaching is a class of children who have only been brought to school late in life, or who are particularly backward from other causes, and these are taught by the "combined method"—that is finger spelling, writing, etc.

Children are admitted to all the schools free of expense. Divisional superintendents of Board schools report cases in their respective districts, and Mr. B. P. Jones (15, Denmark Avenue, Wimbledon), who is the Board's superintendent and organizer of Deaf Schools, arranges for their attendance at the Deaf Centres.

The Association for Oral Instruction of the Deaf and Dumb was founded in 1871. The teaching is the pure oral and that most absolutely, and to this Association is due almost entirely the general teaching of the oral method in this country. Teachers, private pupils, and also some of the School Board class are taught here. Children from a distance are boarded out and the institution gets a grant from the Board of Education. Applications for the admission of pupils should be made to the Director, William Van Praagh, 11, Fitzroy Square, W. C.

The Royal Asylum for the Deaf and Dumb Poor has a branch in the Old Kent Road (but this is about to be disestablished) and has its main establishment at Margate. The institution dates from 1792, long before the oral method was entertained; and although the oral method is now used for 75 per cent. of the children, 25 per cent. use the silent system, and all the children at first make use of signs to a certain extent. It is particularly interesting to see their signs for their various teachers. At the London Branch all children remain for the first three terms, they are then sent down to Margate. The children come not from London alone but from all parts of Greater Britain. The teaching of the children is on the same lines that I have mentioned before, with the important difference that the children in the asylum live all together and do not associate much with hearing people, amongst whom they will afterward have to make their living. On the other hand, the children in the asylum are well fed and well looked after, and attend school regularly. Candidates, aged 7 to 10, are elected twice a year, and all inquiries should be addressed to Mr. F. H. Madden, Secretary, 93, Cannon Street, E. C.

The Training College for Teachers of the Deaf, as its name implies, is mainly for the training of teachers, but there are also some 30 children being educated, some of them being sent from Board schools outside the London School Board area. Many of the female teachers of the London School Board are trained here, and the general teaching is therefore similar. Both this institution and the Association for Oral Instruction, already referred to, are doing excellent work in training teachers, the supply being less than the demand. At this school no boys can be kept after the age of 12, and this involves a change of teachers and environment at a rather important epoch in a boy's life.

The Paddington Home for Deaf and Dumb Children does not advertise in the usual way, but recently sent a note to the various hospitals for diseases of the ear in London, asking that deaf children might be sent to it. On going to the Home I found rather an extraordinary state of affairs. The number of children at the Home on the date of my visit was eight. On inquiring what teachers they had I was told that they had none, but that the children attended a Board Deaf Centre in the neighbourhood. On seeing the children, I found that the only person who could communicate freely with them was a maidservant, who used signs almost exclusively. All these children are taught the oral system to the exclusion of signs at the Board school, and thus their education (if it may be called so) at the Home, is directly opposed to their education at the Board School. By living at the Home the children have the advantage of attending school regularly, but are not liable to inspection by the Boarding-out Committee.

The Jews' Deaf and Dumb School, situated at Wandsworth Common, admits all poor Jewish children over 7 years of age from any part of Great Britain, and at the time of my visit only contained thirty-eight children, all boarders. The number of children being limited, they are exceedingly well cared for, and the life is almost that of a boarding school for the upper middle classes. All the children are taught manual work of various kinds, and are thus enabled to earn their living when they leave the school. The education is by means of the oral system absolutely, and is put to a very severe test, as the children learn not only English but Hebrew in which to say their prayers, and frequently talk Yiddish to their parents. Being boarders, the children attend school regularly, and being comparatively few in number meet many hearing people. All applications for candidates should be addressed to the Honorary Secretary, Rev. I. Samuel, 74 Sutherland Avenue, Maida Vale, W.

The British Asylum for Deaf and Dumb Females has inmates from 10 to 80 years of age, and is rather for the purpose of taking care of those deaf persons who cannot earn their own living, and of teaching others how to do simple work, than of educating them, as the term is usually understood. There are, however, a few classes for the younger inmates, and here the oral system is hardly attempted. The number of inmates is about 35. All applications should be addressed to the Secretary, at 5, Bloomsbury Square, W.C.

On reviewing the subject, one finds that, speaking generally, the oral system is aimed at by all institutions; some consider the oral system applicable to all children who are deaf and not imbeciles, while others use it almost, but not quite, exclusively, and again others consider that it is only useful for about three-quarters of the children under their charge. Comparing the advantages of boarders, boarded-out children, and day scholars, one finds that boarders, except those in all schools, see little of hearing people except their teachers; while day scholars mix with hearing people, but as a rule do not attend school regularly. Those who are boarded out with selected families have, as a rule, the best opportunity of being educated, and at the same time of mixing with the general public.

Except at the Board schools, which provide for the vast majority of London's deaf and dumb, it is as a rule impossible to keep a child at one school for the whole of its education; many of the institutions do not admit children as early as is desirable, and one turns away boys at 12 years of age.

Private schools are not all equally good, and I should advise a medical man to make himself acquainted first with the usual methods of education at a public institution, and then to inspect private schools before recommending any one in particular.

In conclusion, I beg to thank the various secretaries, superintendents, matrons, and teachers for their great kindness to me at the various institutions I have described.

Discussion.

Dr. Love thought that if Dr. Thorne's statistics were meant to represent either the extent or the results of oral teaching in Great Britain, they were misleading. As a matter of fact, there was comparatively little pure oral teaching in this country, and the oral methods often broke down in their use by deafmutes after they entered the work of life. In making this statement, he would be supported by many of the best teachers of the deaf in this country, but in case he should be put down as an opponent of the oral method, he would like to state what he considered as efficiency, and wherein he considered the present methods of teaching orally were inefficient. Efficiency, to his mind, was the ability of the deaf-mute to conduct the business of after-life amongst hearing persons without great restraint or inconvenience. Judged by this standard, the oral method often broke down, and the deaf-mute fell back on the finger method. He did not say it was the fault of the deaf-mute; he was merely stating a fact. With regard to the faults of oral teaching, the classes were too large. The ideal class was one or two pupils to each teacher, instead of eight or ten pupils to a teacher. Given smaller classes and more teachers, he thought oral teaching could be carried out with results gratifying to parents, and satisfactory when considered with respect to the use it was put to in the after-life of the deaf-mute. Mr. Van Praagh held that all deaf-mutes could be taught orally except the idiot and the blind. He felt quite sure that this was not the case, and if his (Dr. Love's) standard of efficiency were accepted, he doubted very much whether, under even the best conditions, the majority of deaf-mutes would not fall back on the finger method in after-life.

Mr. Hunter Tod said he did not agree with Dr. Love. He had had personal evidence of the fact that oral teaching, under a proper system, could be carried out most satisfactorily. When in Berlin he had the opportunity of repeatedly visiting the deaf and dumb institute founded by Dr. Gutzmann. In this institution the children were received at the early age of 5 or 6 years. They were taught in classes of 10 to 15 in number. The deaf-mute was taught to speak by imitating the movements of the mouth and muscles of the face and neck through the sense of sight and touch, and to understand conversation by lip reading. The teaching was at first very simple, but gradually progressive, till at length—at about the age of 16 or 17—the pupil was in every way an intellectual being. As an instance of how successful this training was he mentioned the fact that the older children could converse with and understand him, although a foreigner, and therefore not pronouncing their language properly. The percentage of permanent success was very high. He thought oral teaching was in every way the best method, but the results depended largely on the teachers.

Dr. Atwood Thorne, in reply, said he had carefully refrained from advocating one or other system, but simply gave a description of what he found at each school. He had certainly met with many of the older children with whom he could talk quite comfortably, and he thought such children would continue to use the oral method after leaving school. The London School Board paid their teachers well, and never had more than eight children to one teacher.

LXXIII.

THE TREATMENT OF DEAFNESS OF MIDDLE-EAR ORIGIN.

By Chalmers Watson, M.B., F.R.C.P.E.,

EDINBURGH.

When I accepted the courteous invitation to read a paper before the members of the Otological Section, dealing with a method of treatment of deafness of middle-ear origin described by me in a recent paper, I was fully conscious that the time at my disposal was quite inadequate for a satisfactory treatment of the subject. My first duty, therefore, was to determine the line I ought to follow in order, on the one hand, to minimize the dissatisfaction that inevitably attends a restricted exposition, and on the other hand to attain the maximum result in practical utility. Three courses lay open to me. The first was to record the series of investigations which ultimately led me to think that bone marrow contained a substance which might be applied beneficially in cases of chronic ear disease. The second course was to deal with the etiology of fibroid changes in general, and in chronic aural disease in particular, so far as that might have a bearing upon the rationale of the treatment adopted. The third course was to communicate the subsequent history of some cases already recorded, and to report the measure of success which has resulted from the treatment of fresh cases.

After careful consideration I decided that the last course was the best for the purpose of the present meeting. The first course would merely show the method of induction, and would scarcely raise a presumption in favor of the conclusion arrived at. Instead of following it I take the liberty of referring members to a number of photographs exhibited in another Section, which demonstrate the effect of applying myelocene in cases of psoriasis, lupus vulgaris and senile baldness, In cases of psoriasis and other skin lesions a good result was obtained not only by local application, but by application at a distance. I have also got a decidedly favorable reaction by the internal administration of myelocene in a case of chronic exfoliative dermatitis. These results, in my view, raise a strong presumption in favor of the theory that there is an active therapeutic agent in myelocene.

I rejected the second course with reluctance, because I think that chronic ear disease can be brought into line with other pathologic processes with which at present it is seldom or never associated, and it may be laid down almost as an axiom that without apprehending the relation of cognate diseases it is impossible to arrive at sound principles of treatment. But this course would lead to a consideration of the great problems of immunity and protection, and of the special causes which determine an infective process to manifest itself in one form of disease rather than in another.

Accordingly, I propose to submit to you the further history of a few typical cases already reported, and to record the results obtained in cases recently submitted to treatment.

The first three cases were sent to me by Dr. Haig Ferguson, and were included among the successful cases referred to in my paper. (British Medical Journal, March 22nd, 1902.)

Mrs. A. came under my care in October last with the knowledge and sanction of the aurist under whose care she had previously been. The case was a typical one of chronic non-suppurative middle-ear disease, the duration of the deafness being at least twelve years. The deafness was slowly increasing. This patient responded to treatment at once. Within twenty-four hours from the onset of treatment all the familar house sounds became "very obtrusive." In the course of a fortnight the hearing powers improved for a low conversation test from

Right ear 20″ to 25″
Left " 10′ to 17′

The improvement of a few inches for the low conversation voice test represented a marked improvement for ordinary conversation. The patient could now hear ordinary conversation at a dinner table with the worse ear, which she had not previously been able to do. Treatment extended over three weeks, and a fortnight after its cessation she reported that she could now hear in the dress circle of the theatre nearly every word spoken on the stage, whereas two years previously when seated in that part of the house she had been unable to distinguish anything. Two months later she reported that the improvement had been maintained and objective examination confirmed this. A further course of treatment was given at this time and resulted in a further gain, but not in the same proportion as before. When last seen in the end of June the patient reported that the improvement had been fully maintained and, if anything, had increased. The net gain in this case may be summarized as follows:

Not only was the deafness prevented from getting worse, but the hearing power was materially improved, and this improvement has been maintained unabated for some months.

Mrs. B., the second of these cases, was extremely deaf. She could only hear shouting in the right ear at 18″ and left ear at 4′. Conversation had to be carried on in a much raised voice a few inches from the good ear. In the course of the last twelve years she had been under treatment by many experts without obtaining any benefit of which she was conscious. The disease was apparently progressive, as the deafness had increased in the course of the past year. The case was a typical one of advanced chronic middle-ear disease of a non-suppurative nature. The pinna was extremely hard and inflexible, and the meatus was very narrow. Treatment extended over four weeks in October and November, 1901, and effected a very marked improvement. The hearing distance increased from 18″ to 12′ in the right ear, and from 4′ to 17′ in the left. This gain enabled the patient to hear loud conversation much better than formerly, and it was accompanied by improvement in the patient's speech. She ceased to use the low, whispering tone characteristic of some very deaf subjects. This improvement was probably due to her hearing her own voice. At the same time the expression of her features was much improved and she lost a markedly nervous manner which had been growing on her and leading her to seclude herself from all social contact. The treatment in this case was much interrupted by a blocking of the ear, due to an unabsorbed residue of the oil congealing on the membrane. This blocking occurred repeatedly, even although only three or four drops of oil were instilled into the ear, and notwithstanding the ear being syringed immediately after its application. This blocking caused an impairment of the hearing power, from which the patient recovered by careful syringing. Treatment was stopped in the beginning of November. Five months later the husband reported that there had been a gradual loss of the improvement, and that the patient was now nearly as deaf as she had been before treatment. The patient herself reported that the deterioration had been more marked in the last four or five weeks. Objective examination showed that the hearing was nearly, but not quite, as bad as ever. A second course of treatment this summer has been successful in effecting in the good ear an even greater measure of improvement than that previously obtained.

On this occasion no subjective improvement was observed until the tenth day, but in a few weeks it was very marked. Another point of interest was the entire absence on this occasion of the sensation of blocking, which had been so marked a feature of earlier treatment. A further noteworthy point is that the patient had now a persistent feeling of clearness in the ear and side of the head to a much greater degree than was observed after the first treatment. The improvement in the hearing was obvious to all the patient's friends. Here, again then we have a case where deafness had been steadily increasing, notwithstanding the use of the recognized methods, where treatment has been successful not only in preventing further loss, but in adding materially to the hearing powers. The case is instructive as to permanency of the improvement which may be gained.

Mrs. C. merits a brief record on account of her age—82. The advisability of any active treatment in a patient of such a ripe age is certainly open to question; the soundest plan is to rest content with the power spared by Nature. At the request of the patient's friends I treated her for a short time. The chances of success were minimized by finding that the case belonged to the mixed type of deafness.

The treatment extended over eight days and gave a satisfactory result. Ordinary voice—Right ear, 3′ to 15′ left ear 11′ to 17′ and the patient was aware of improvement, though not in a marked degree, but her friends reported that there was a material gain as they could carry on conversation with much greater ease than formerly. At my request Dr. Haig Ferguson visited the patient some weeks after the cessation of treatment, and he reported that there was undoubtedly a distinct improvement in the hearing power.

Reference may be made to the further history of the two cases that were fully reported in my original paper as under the critical observation of independent experts.

Miss D. had previously undergone the routine treatment in skilled hands with out appreciable benefit. A marked improvement followed the use of myelocene. Eight days after the cessation of treatment she and also her friends were aware that she had lost a little of this improvement, and on examination I found this to be the case. By this time I had formed the opinion that a complete cessation of the treatment in this case would be followed by a diminution in the hearing power, but that this loss could be regained by a subsequent course of treatment, and, at my suggestion, Dr. Logan Turner kindly undertook to observe and record the case with the view of determining the accuracy of this belief. The subsequent course justified the opinion formed. The last published record of this case was on January 26th. Contrary to my expectation in June the patient reported that the hearing power had remained as at that time, and was still considerably greater than before the original treatment in June, 1901.

Mr. E., a cycle maker, who suffering from actively progressive middle-ear disease of four years' duration was selected by Dr. McBride and myself as a man in whom the chances of the results being vitiated by a neurotic element were reduced to minimum. From the outset of treatment the improvement was marked and soon became obvious to the patient's wife and his friends, who were unaware of any treatment being carried out. Not only did the hearing power markedly improve, but the patient's mental state was bettered; he lost the feeling of persistent depression that had lately been an outcome of his auditory defects.

Little or no improvement was apparent to the low voice test. When seen in January, 1902, six months after cessation of treatment, Mr. E. stated that the improvement had been maintained. He also reported that in the course of these six months the occasional colds to which he is subject have given him only very slight inconvenience, whereas formerly a cold was accompained by a marked increase in deafness and considerable general discomfort. In July, twelve months after the treatment, the patient was conscious of some impairment and also a slight return of the sense of fullness and heaviness in the head that had been so prominent a symptom formerly, but which had been absent for nine months. The impairment was as yet very slight and had not been observed by the patient's wife. The Eustachian catheter was passed at this time. The passage was free and no improvement followed catheterization. I have little doubt that the recent increase in symptoms will disappear as a result of further treatment. From the point of view of patient and his friends this record must be regarded as highly satisfactory.

A word as to the unsuccessful cases. My original paper showed that out of 15 cases submitted to treatment, practical benefit had accrued to the patient in 60 per cent. of the cases treated. With regard to experience of later cases I must content myself with stating that a further experience has only served to confirm the favorable opinions previously formed as to the benefits obtainable in many cases.

From the foregoing records we are, I think, justified in concluding that by this treatment we can improve the hearing in many cases of chronic non-suppurative middle-ear disease to an extent considerably above that attainable by present methods.

A question will naturally arise as to the class of cases in which some improvement may be looked for from the treatment recommended. My experience on this may be summarized.

1. Cases in which the pathologic process had apparently been arrested, as evidenced by no further deterioration in the hearing power having occurred for a few years previously have given little or no result.

2. The existence of internal ear disease does not contraindicate treatment being tried, as I have found a marked in 3 out of 7 cases submitted to treatment. In 2 of these cases the patient did not hear the tuning fork when placed over the mastoid, but, as a result of treatment, the same tuning fork became clearly audible. In cases with internal ear complications extra care must be taken in the application of any mechanical stimulation to the middle-ear.

3. Any case that is not improved by the local application of myelocene alone, and where the hearing is made worse by even a small amount of mechanical stimulation is unsuitable for this treatment.

THE EVIDENCE AS TO THE IMPROVEMENT IN THE HEARING POWER.

Some reference should be made to the evidence of improvement in the hearing power. As we are dealing with incurable disease, all treatment is directed to the relief of its leading symptoms, and as these are so largely subjective we must rely mainly on the subjective experiences of the patient. In general we may take it that the possessor of the organ of hearing is the best judge of how that organ is fulfilling its function. In this we adopt the same test as in the case of stomachic, cardiac, or other similar disease. In the case of the ear we have of course a valuable means of corroboration in the voice test. In my experience, however, these tests differ greatly in value. Thus I have found the whisper test or a very low voice test give quite unreliable results as to a patient's hearing power for practical purposes. A pertinent illustration may be given in the case of a patient, aged 42, recently sent to me by Dr. Paterson, Leith. Like the other cases this subject had previously been treated by experts on the recognized lines, but without benefit of which he was conscious. In this instance a distinct improvement was apparent to all the patient's friends, and the patient himself was able for the first time to use the telephone, yet my record shows no decided improvement for the low voice test. To my mind convincing evidence against the reliability of certain voice tests is to be found in the records of two independent experts in my original paper. I would more particularly refer to the record of figures there made by Dr. Logan Turner, who found in a patient on

October 9th. Whisper test, R. 4″, l. 6″; ordinary voice, R. 60″, l. 96″
January 26th. " R. 6″, l, 8″; " R. 17″, l. 36″.

The patient and her friends were conscious that the hearing power for practical purposes had undergone a great deterioration between the two dates. The figures of the latter date for the whisper test fail to disclose this deterioration, but would actually indicate a slight improvement.

TECHNIQUE.

The method of treatment as originally described was as follows: It consisted in instilling into the ear half a drachm of equal parts of warm rectified spirits and glycerin. and applying the same quantity to the skin of and around the ear. This was accompanied by massage of and around the ear and various movements, mainly those of intermittent pressure over the external meatus continued for some minutes to each ear. The excess of fluid was then removed. Then followed a similar application of myelocene, 5 to 10 drops of the warm clear oil being dropped into the ear with a pipette previously warmed by passing through a flame; and about 10 to 20 drops were rubbed on outside the ear. This operation occupied about ten minutes for each ear. During the treatment the head was laid flat, jaw movements were employed on account of a supposed favorable influence on the middle-ear circulation, and the hearing was exercised repeatedly. In most cases this treatment was carried out daily, and in some on alternate days only. The Eustachian catheter was employed from time to time. In some cases it was found that distinct benefit followed the use of the catheter, although previously its use had effected no improvement. It was found that the absorbent properties of the ear structures varied considerably. Sometimes the oil was not absorbed, and the residue solidified on the membrane, and interfered mechanically with the hearing power. Since the publication of my paper I have been employing various modifications of this treatment.

(*a*) Instead of using the preliminary stimulation with rectified spirits and glycerine, I have rather relied upon the heat of the oil and the mechanical stimulation by movements to provide the necessary vascular reaction. This method is a saving in time, and so far seems to me to be equally successful.

(*b*) Various mechanical appliances have been tried as a substitute for the digital manipulations—namely, the special apparatus for vibratory aural massage familiar to experts in the Swedish system of massage and also the use of a vibratory apparatus similar to that known as the vibratorium method.

(*c*) A trial has also been made of pneumatic massage of the membrane and middle-ear structures, conducted simultaneously in the outer ear and in the middle ear through the Eustachian tube, after the method which I learned from a Swiss physician, Dr. Mermod.

I believe that these forms of mechanical stimulation, judiciously used, are important factors in treatment.

PRINCIPLES OF TREATMENT.

The principles of treatment in this affection are:

1. The promotion and maintenance of a more vigorous circulation in the middle-ear with the view of (*a*) increasing the resisting powers of the tissues, and (*b*) promoting the absorption of morbid products where possible. I believe that not enough is attempted in the way of judicious stimulation of the middle-ear structures. The present practice appears to me to be too much restricted to momentary stimulation effected by the use of Politzer's bag or the catheter.

2. The maintenance of thorough aeration of the nasopharynx and middle-ear. This acts favorably, not only through its influence on the tension of air in the tympanum, but also by its action in maintaining a healthy state of the circulation in the middle-ear and of the secretory glands in the mucous membrane of the nasopharynx.

3. The restoration of a greater degree of flexibility to the tympanic membrane and associated structures. The normal tympanic membrane contains fatty constituents to an extent that interferes considerably with its staining properties on histologic examination, and in the disease

under consideration this property largely disappears. It is reasonable to think that an oil which is an internal animal secretion would possess greater value than other oils, and this is borne out by my own experience.

What that value is and how the oil acts must be determined by the methods of clinical, chemical, and physiologic investigation. I have laid before you the evidence from which I conclude that myelocene is clinically useful. From chemical analysis of active and inactive extracts of bone marrow no results have been obtained. The method of physiologic investigations remains. For this method the important facts contained in the above record are as follows:

1. The application of myelocene is not necessarily local, although it may have a special action locally. It acts at a distance after inunction and by absorption through the alimentary canal.
2. In the diseases referred to the changes are largely those of a fibroid nature.
3. The substance is found in the bone marrow, which is the seat of formation of the white corpuscles and other cellular constituents of the blood.

It would therefore appear probable that this substance acts in one or both of the following ways:

(*a*) By an increased vascular activity, more especially of the capillaries.

(*b*) Specifically, in virtue of an enzyme or other active principle found in the bone marrow.

The chemical analysis of myelocene referred to in my paper was conducted by J. F. Macfarlane and Co., manufacturing chemists, Edinburgh, under my own direction, and that firm is now able to supply a preparation of the substance.

Discussion.

Dr. Love had kindly been supplied by Dr. Chalmers Watson with some of this preparation, and had used it as carefully as he could. In one or two of his cases—he had treated five or six altogether—temporary improvement had not been maintained. The temporary improvement he attributed to the stimulating effect on the local circulation, and to the mechanical effect of the oil when in a liquid state in assisting in the conduction of aerial sound waves. Dr. Love regretted greatly not to be able to state that the improvement had been permanent, for the class of cases which myelocene attempted to deal with were amongst the most hopeless coming under the notice of the aural surgeon.

Mr. Lake said that when he was younger and more hopeful of improving this class of case he tried a novel intratympanic injection; the result was excellent, but the duration of the improvement short and relapse certain. He alluded to the ancient custom of painting the membrana tympani with $AgNO_3$, and suggested that a like irritation might be obtained by the method under discussion.

Dr. Pinder stated that he had to some extent tried myelocene in a number of cases, but without an encouraging result. That, however, in fairness it should be stated that the directions laid down by Dr. Watson had not been fully carried out. In his article in the British Medical Journal he recommended instillation of spirit and glycerine, to be followed by the myelocene. He had used the latter alone. Further, as no standard preparation of the myelocene was at that time obtainable from any chemist, it was quite possible that the substitute, though prepared in accordance with the formula given, might prove more or less inert.

Dr. Jobson Horne asked for information about the composition and specific virtue of "myelocene," and for what particular form of middle-ear deafness it was remedial. The results obtained from its use by Dr. Chalmers Watson did not convince Dr. Horne of its efficacy, and in the hands of others the effects produced appeared to have been of only a transient character. Dr. Horne was therefore disposed to accept the views put forward by previous speakers that the effects produced were due to a local stimulation of the circulation of the middle-ear. Personally he had had no experience with "myelocene," and could not criticize it. One was naturally slow to accept a new preparation as a remedy for a disease which had long baffled treatment, more particularly whilst the remedy was still in the stage of empiricism. At one time the "sheep's wool treatment" of deafness was in vogue, that was many years ago; one speaker had said 250 years ago, and that the virtue of the treatment depended upon the wool used being the curly lock upon the forehead of a black sheep. Pliny also spoke of the therapeutic value of sheep's wool. Dr. Horne thought it was just possible that ultimately it might be shown that all these remedies for intractable middle-ear deafness possessed the same active property.

Mr. Mayo Collier said they were all ready and anxious to welcome any improvement in the treatment of chronic middle-ear disease and more especially from Dr. Chalmers Watson, who had frankly and fully laid his views before the meeting. It would be quite unwise to jump to any conclusions on the small number of cases yet treated. He felt sure they were all prepared to hold an open mind on the question and give the suggestion a fair trial. Mr. Collier would not prophesy, but he feared this remedy, like so many others that had been extolled as sovereign cures, would be doomed to disappointment. Most of the injections into the tympanum acted as stimulants and acted also mechanically, inducing movements of the parts and an increased rate of lymph and blood flow so, as it were, rousing the parts into temporary activity.

The President said that in a few cases he had made use of the line of treatment advocated by Dr. Chalmers Watson. His idea was that the collateral treatment used at the same time had a great deal to do with the slight improvement obtained. The fact, also, that even the usual cases of middle-ear catarrh varied from time to time, and the fact that fostering a hope that improvement might result, were factors not to be lightly dismissed in estimating the value of any particular line of treatment. He hoped that Dr. Chalmers Watson would prosecute his inquiry, and report his results later on.

Dr. Chalmers Watson, in reply, drew attention to the diversity of of the results obtained by the different speakers. On the one hand, Dr. Love by the use of a reliable preparation, had found temporary improvement in a series of 4 cases; and on the other, Dr. Pinder and the President had found that no benefit followed the use of a preparation prepared by themselves, and tried by Dr. Pinder in a large series of 30 or 40 cases. These results were extremely interesting, and confirmed the speaker's observations as to different qualities of bone marrow. The good results obtained by the author in the favorable cases recorded had not been of the transient nature which Dr. Love had experienced, and his own experience led him to give a very favorable opinion on all cases that gave temporary improvement, to which Dr. Love had referred.

LXXIV.

REMARKS ON THE ANATOMY OF THE TEMPORAL BONE, WITH LANTERN ILLUSTRATIONS.

DR. R. C. ELSWORTH,

SWANSEA.

Dr. Elsworth showed a carefully selected and interesting series of anatomic specimens of temporal bones, and illustrated many of them by means of the lantern. The main point in his demonstration was to point out the existence of an almost constant cell or cavity which lay behind the antrum and was situated in close juxtaposition to the anterior extremity of the transverse sinus, just as it began to form the sigmoid. From this cavity a vein proceeded and ended in the sigmoid sinus. Dr Elsworth wanted to dignify this cavity with the name of "accessory antrum" in order to aid descriptive anatomy.

Dr. Love thought the meeting was indebted to the demonstrator for the exhibition of slides which had just been given. But he regarded with much trepidation the addition of anything like an "accessory antrum" to the already complicated terminology of the anatomy of the temporal bone. It seemed to him that the so-called "accessory antrum" was nothing more than the upper set of mastoid cells, and was in much more direct communication with the mastoid cells proper than with the mastoid antrum. Its existence and description as the upper set of cells was quite clearly given in textbooks on the anatomy of the temporal bone, namely, Broca's, recently rendered into English by Mr. McLeod Yearsley.

Dr. Jobson Horne pointed out how important it was in the operative treatment of disease of the antrum to be aware of these aberrant cells. The addition of terms to the nomenclature of the anatomy of the temporal bone he hoped would be kept as far as possible under control, more particular in the use of the term "mastoid." The term "accessory antrum" as suggested by Dr. Elsworth, he thought was more applicable to the cell he had described than that of "aberrant mastoid cell." The vein Dr. Elsworth had met with in the accessory antrum, and had found passing into the sigmoid sinus, Dr. Horne took to be the petrosquamosal sinus, which Mr. Arthur Cheatle had carefully investigated. Its importance as a pathologic factor, especially in early life, was probably not sufficiently appreciated.

LXXV.

APPARATUS FOR INTRATYMPANIC HOT-AIR TREATMENT OF CERTAIN FORMS OF CATARRH OF THE MIDDLE EAR.

By Dr. Adolph Bronner,

BRADFORD.

He showed an apparatus for the intratympanic hot-air treatment of catarrh of the middle-ear. It consisted of a metal air-tight cylinder, lined with asbestos, which fitted over a Prometheus heating oven. The heat was generated by the electric current passing through specially-prepared thin mica sheets. It could be regulated by a patent three-contact system, by means of which four degrees of temperature could be obtained. The cylinder was connected with a large hand pump, or with an American air receiver, by means of which a constant and regular current of air could be produced for any length of time. The hot-air was blown through an ordinary Eustachian catheter into the middle-ear. The air should be applied for a lengthened period of time, one-half to five minutes, according to the nature of the case.

Dr. Bronner was using the apparatus for cases in which the mucous membrane of the Eustachian tube and middle-ear were affected, and in cases of so-called dry catarrh. In some chronic cases of tinnitus the results were excellent. Also in cases of recurrent catarrh of the middle-ear. Dr. Bronner hoped to improve the apparatus still further, and at some future meeting to bring forward statistics of cases treated by this method.

Dr. Pinder corroborated Dr. Bronner's remarks as to the value of the application of heat in ear disease, and had found it valuable externally as well as internally. In catarrhal deafness he had been accustomed to recommend, with advantage in some cases, an application of heat somewhat on the lines of the Tallerman treatment, such as the placing of the arm on the affected side in the open oven, resting the limb upon a wooden box and cushion for twenty minutes or half an hour at a sitting.

ABSTRACTS FROM CURRENT OTOLOGIC, RHINOLOGIC AND LARYNGOLOGIC LITERATURE.

I.—EAR.

The Indications for the Radical Mastoid Operation, with a Description of Its Technique.

W. Scott Renner, Buffalo, N. Y. (*Buffalo Medical Journal*, June, 1902.) The various conditions which demand the performance of the radical mastoid are discussed somewhat in detail, special consideration being given to true and false cholesteatoma. The latter condition is more truly an otitis media desquamatosa, and is to be differentiated from the true cholesteatoma, which is a tumor surrounded by a fibrous membrane, and connected with the periosteum of the cavity in which it lies, of smooth surface, and formed of onion-like lamellae of polygonal, epidermoidal cells, between which are often found cholesterin crystals in varying quantities.

The point is made (which the reviewer has often noticed), that in many of these cases the sigmoid sinus lies far forward and may be only two millimeters from the posterior wall of the external auditory canal. When this is the case, the regular Stacke operation must be performed.

The plastic of Stacke is preferred, a flap being made of the posterior cutaneous wall by separating it from the auricle by an incision at the point where it is attached, and making a second incision at right angles to this along the posterior superior border of the canal. This flap is laid in the inferior portion of the bony cavity, and the dressings hold it in position. *Richards.*

The Early Diagnosis and Treatment of Acute Mastoid Inflammation.

T. H. Halstead, Syracuse, N. Y. (*Philadelphia Medical Journal*, August 2, 1902.) Where the diagnosis is in doubt, pain, increased temperature and the result of pressure are important symptoms. Deep pressure with the finger over the antrum and tip of the mastoid should be made on each side. The pain may be referred to the whole side of the head. The classical symptoms of heat, swelling and redness over the mastoid are late signs of mastoid inflammation, and the diagnosis ought to be made earlier than these manifest themselves, and before the bone is so extensively broken down.

Examination of the pus discharge is important, both as to diagnosis and prognosis, as streptococcus infection is more severe and destructive than infection due to the presence of staphylococci or pneumococci.

At the first sign of acute inflammation of the mastoid the patient should be put to bed, given a brisk purge, and a free incision made in the posterior inferior quadrant of the drum, extending to the attic should there be any bulging there. If this is done, most cases of acute mastoid inflammation will begin to subside. If subsidence does not promptly occur, or if this treatment be applied too late, operation will be required.

The goal of the operation is to reach the antrum, and in early cases antral drainage may be sufficient, "but ordinarily there has been quite a destruction of the bone, and all the soft bone, granulation tissue, etc., should be removed, and this will often mean the removal of the whole cortex and all mastoid cells extending down to the tip." *Richards.*

Ablation of Both Mastoids for Chronic Suppurative Inflammation of the Middle Ear,

E. E. HOLT, Portland, Me. (*Journal of Med. and Science*, May, 1902.) The case was followed by extreme variations in the temperature of the different parts of the body at the same time and of the whole body at different times, of more than twenty degrees Fahrenheit. There existed extreme high temperature in the mouth (114° + F., 45.5° + C.) with extreme low temperature in the rectum (94° — F., 34.4° — C), then changing to low temperature in the mouth with extreme high temperature in the rectum, again changing to extreme high temperature in both the mouth and rectum, to be followed by extreme low temperature in both the mouth and rectum, the extremes of temperature not being measured by any available thermometers that registered more than 94°F. to 114° F., and four thermometers were broken by the intense heat. Later amblyopia developed in both eyes. Complete recovery.

Operation was done for chronic suppuration in the left mastoid on February 1, 1901; in the right mastoid in April, 1901; the cells being found extensively diseased in in each instance. The patient was dismissed free from discharge with good hearing in both ears. Six months later she again came to the hospital on account of a clear gelatinous discharge from the right ear containing staphylococci, and the tympanum was curetted on Nov. 18th. On Dec. 18th, temperature was 102.6; on the 21st, 104, without chills, giddiness, nausea or vomiting, but with ill-defined pain on the right side of the head and with no special point of tenderness. On this side the ossicles were removed, the tympanum curetted and the lateral sinus opened; this latter appeared normal. On January 10th, it was 101 in the morning and 108 at 10:15 p. m.; pulse 86. On Jan. 11th it was 97.4 in the A. M.; pulse 116; and on this day the lateral sinus was opened again, and the temporo-sphenoidal lobe of the brain explored. There was evidence of considerable pressure, and the dura markedly pulsated. The temperature was about normal for the next 15 days, the pulse ranging from 80 to 100. Jan. 26th, the temperature ranged from 98.6 to 108, and from this date to Feb. 11th, the temperature varied from 97 to 114, being frequently 111, and on 27 occasions went as high as 114 or higher, with a pulse of from 80 to 96, the temperature being taken nearly every two hours. There was no uniformity between the temperature in the mouth and the temperature in the rectum, there being frequently a difference of from 3 to 6 degrees, sometimes one, sometimes the other being the highest. On Feb. 12th, temperature went to 94, and was subnormal most of the time for 3 days, when the patient left the hospital. Recovery was complete. Patient was not so sick as would be expected in one whose temperature was so profoundly disturbed. The author thinks that there was some profound disturbance of the heat controlling centers, but is unable to explain it.

Richards.

Indications for the Mastoid Operation.

Philip Hammond, Boston (*American Medicine*, April 12, 1902), thinks that many cases of threatened mastoiditis can be aborted by free incision in the drum membrane, followed by hot douching every two hours; but warns against being misled by the diminution or absolute cessation of the discharge, as this does not necessarily mean that the patient is becoming better; since there is a natural tendency on the part of the drum to close over, and this must be prevented. The fact that there may be no accompanying increase in temperature has no significance, as the mastoid may be involved very extensively without any increase in temperature. While regarding tenderness of the bone as an important symptom, it may be absent and the mastoid still be filled with pus. He does not think that primary mastoiditis occurs, but that it is always subsequent to purulent involvement of the middle ear. *Richards.*

The Treatment of Thrombosis of the Lateral Sinus Following Middle-Ear Suppuration.

Edw. B. Dench, New York (*American Journal of the Medical Sciences.*, May, 1902), has operated upon 22 cases of sinus thrombosis. Of these, two have died, one of septic pneumonia, and the other of acute nephritis apparently induced by the administration of ether. The internal jugular was ligated in four cases only, and all of these recovered. It is his practice in every mastoid operation to remove thoroughly all evidences of carious bone and to follow the softened bone to the dura in every direction if this be necessary for the complete eradication of the infected area. Unless the lateral sinus appears perfectly healthy on palpation, it is his practice to incise the sinus wall for exploratory purposes. He formerly did this with the exploring needle, but found that in some instances fluid blood was withdrawn even where infection of the sinus had taken place; so that he now incises the wall sufficiently to make sure of the condition of the blood sinus. Before doing this, however, the mastoid antrum area is entirely packed off by means of iodoform gauze, and the entire field of operation is thoroughly cleansed, and all instruments carefully resterilized before this incision is made, the sinus being exposed by removing the bony covering of the sigmoid groove for at least three-quarters of an inch. The incision is made about the middle of the area of sinus exposure. "If there is a clot in the sinus at this point, there will either be no hemorrhage at all or a very slight hemorrhage from below. A curette is then passed into the lumen of the sinus, and the clot removed, so that free bleeding is established from below. Pressure is now applied at the point of incision in the sinus, and the pressure above is removed. If free hemorrhage does not occur from the direction of the torcular, a curette is introduced in this direction, and the lumen of the vessel thoroughly curetted until free hemorrhage is established, it being imperative that free hemorrhage be established from the upper end of the sinus, excepting in those cases where the lumen of the vessel is occluded by a firm fibrinous clot which has evidently been in position for a long time and has become thoroughly organized. Where such a condition is found, and where the lumen of the vessel seems to be obliterated and the entire vessel has been converted into a mass of connective tissue, it is then unwise to attempt to break down this firm plug in the upper portion of the sinus. Naturally if the clot has become firmly organized no further infection can result from it. Where free hemorrhage is established both from the upper and lower angles of the sinus wound, or where the upper portion of the vessel seems to be firmly occluded by an organized clot and there is moderate bleeding from the lower angle of the wound, I do not deem it advisable to institute a more radical procedure at the time of the primary operation. Hemorrhage should be controlled by firmly packing the sinus wound by means of iodoform gauze, and shutting off the sinus area from the middle ear and adjacent mastoid cells by means of a firm packing of iodoform gauze. Such a dressing will remain in position for from four to six days, and there is no indication for its removal unless there is a sudden rise of temperature to 103 or 104 F."

No unfavorable issue follows the exploration as an operation by itself. If, however, the temperature after one to three days shows any indication of systemic infection, he incises the internal jugular by exposing its entire length by means of an incision from the sternal attachment of the sternomastoid muscle to the tip of the mastoid process. The vessel is dissected from its sheath low down in the neck, surrounded by two ligatures, and divided between them. The distal end is then clamped with an artery clamp, raised by an assistant, and rapidly dissected upward until the common trunk of the temporal and facial is reached. This trunk is surrounded by two ligatures and divided between them. If the thyroid veins are large they are treated in the same way and any other veins which appear large enough to occasion free hemorrhage. In this way the entire trunk of the jugular is dissected out from just above the clavicle to just below the base of the skull, where two ligatures are again thrown around the trunk of the vein and the vessel divided between them. "The lateral sinus having been freed of all infectious material from above, and the jugular trunk having been removed in its entirety from below, there only remains a small portion of the sinus occupying the jugular fossa, and commonly known as the jugular bulb, which can be a source of infection. Simple cleansing by means of irrigation through the sinus wound will effectually free the jugular bulb from any infectious material."

Some illustrative cases are then reported. The author believes that in all doubtful cases the internal jugular should be removed, but does not advise that in *every* instance of sinus thrombosis that this be done. He considers that where the patient has been under observation for a few days, with a fairly complete temperture record of from 24 to 48 hours, with no marked evidences of systemic infection, the surgeon may rely upon simple clearing out the clot in the sinus if this be found; but in those cases which are first seen at the time of operation and in which the sinus cannot be properly cleared, and in which also the surgeon is confident that a certain amount of infected material is left in this venous channel, immediate incision of the internal jugular is demanded. The temperature chart is the only sure guide. Tenderness in the neck may be present or it may be absent. A remittent temperature which is gradually becoming higher and higher, with a certain knowledge that the lateral sinus is already invaded, should be followed by excision of the internal jugular. *Richards.*

Sinus Thrombosis Depending on Middle-Ear Disease, with Report of s Case Following Acute Sore Throat.

Geo. F. Cott, Buffalo. (*American Medicine*, April 19, 1902). The case reported is that of a young man of 18 who had a running ear when three years old, measles at eight and was subject to tonsillitis. Following a sore throat he had earache and a watery discharge with rise of temperature followed by chills. On admittance to the hospital temperature was 102. On opening the mastoid no pus was found, but the bone was soft and there was granulation tissue in the antrum. No improvement followed the operation; on the contrary there was high temperature, chills, perspiration, constipation, but no loss of consciousness. The retinal vessels increased in prominence in the right eye. The day following there was tenderness and a cordlike feeling along the course of the internal jugular vein on the left side with a temperature of 105. The next day the temperature was 106.4; pulse, 118. Internal jugular was opened quite low down, found empty, and three-quarters of an inch of it removed. The sinus was then opened for one-half inch, and a thrombosis found, exposed and three-fourths of it removed, when free bleeding taking place the rest was rapidly removed and iodoform gauze packed into the wound.

Patient slowly recovered, recovery being complete, but there was considerable pyemia for some time, the temperature only gradually dropping to normal. The author thinks this was a case of thrombosis following an osteophlebitis, which in its turn was caused by some infection from the throat. *Richards.*

The Exenteration of the Cavum Tympanum for Acoustic Purposes.

G. GRADENIGO (*Arch. fur Ohrenh*, Bd. 54 and 55), states that 3 classes of cases give indication to operation for the purpose of bettering the hearing; (1) the chronic, dry, sclerosising catarrh; (2) remains after otitis media; (3) those cases which according to the anamnesis arise from an otitis media acuta but which objectively resemble a dry catarrh. The indications for operation are rendered more difficult by our incomplete methods of testing. In the operation, everything depends on preventing a great reaction. This happens especially in these of the 2nd class. Syringing must be relinquished. Blood clots must be carefully removed since they furnish a favorable culture medium for the pus germs; 9 carefully observed cases illustrating the above, show, however, how doubtful the prognosis of operative interference is. The author's conclusions are: (1) The results of the operation are the better, the less the internal ear is affected. (2) In the sequelae of otitis media suppurativa with partial destruction of the drum, especially the cases which present the picture of a catarrhal otitis with an anamnetic suppuration. (3) Less favorable results in chronic, dry catarrh: still better in sclerosis. (4) The post operative treatment is important. *Levy.*

Diplacusis Monauralis.

E. BERTHOLD. (*Archiv fur Ohrenheilk.*, Bd. 55.) A very musical man suffered, in the course of an otitis media acuta, with disturbances in the perception of tones in the diseased ear. In addition to the correct tone he heard another, which differentiated itself above or below, according to the position of the tone near the third or fifth. The phenomenon disappeared with the healing of the process. The author believes the middle-ear to be excluded as the seat of the disturbance, and thinks that there was an exudative clouding of the labyrinthine fluid or swelling of the basal membrane, caused by the middle ear process, which causes a disturbance in the fibres of corti. In this way, the sounding of any tone would excite not only the corresponding fibre, but at the same time one of the neighboring ones, and cause its specific tone sensation to be carried to the brain. *Levy.*

The Use of Local Anesthetics in Operations on the Drum and Meatus.

HAUG (*Archiv fur Ohrenheilk.*, Bd. 55) discusses the numerous cocain solutions in use and comes to the conclusion that all of them have insufficient action. Orthoform as a powder has the best effect upon the pain in an open middle ear, and often on the pain of a furuncle which was insufficiently opened. Chlorethyl ether, and Schleich's infiltration are not to be used in the ear. *Levy.*

The Mechanism of the Growth of Cholesteatomata.

A. EPHRAIM (*Archiv fur Ohrenheilk.*, Bd. 54) observed a case of cholesteatoma of the mastoid in which in spite of a broad opening and evacuation, and even after complete epidermization of the cavity, new cholesteatomata continually arose. After removal of the later, a red surface was visible; a remarkable circumstance was the gradual enlargement of the cavity. Since a pressure influence is excluded in this case, the author concludes that cholesteatomata wear the surrounding bony wall away not by pressure but by direct action. *Levy.*

Neurosis and Mastoid Operations.

STENGER (*Arch. fur Ohrenheilkunde*, Bd. 54), reports 10 cases of operation for purulent mastoiditis where the complicating nervous affection was decidedly bettered thereby. These were 2 epilepsy, 1 chorea minor, 1 hysteroepilepsy, 4 hysteria, 1 menstrual disorder and 1 multiple sclerosis. The author regards an etiologic relation between the ear suppuration and the nervous disease as excluded. He explains the result rather by the operative shock, (2) hemorrhage, (3) the energetic drainage of the cranial cavity during the post operative treatment by absorbing dressing, i. e. by removal of the blood from the diseased parts. He recommends therefore in similar cases that the cranial cavity be opened in operation on the ear. *Levy.*

Thrombosis of the Bulbus Venae Jugularis.

STENGER (*Arch. für Ohrenh.* Bd. 54) has examined a number of temporal bones, under the direction of Trautman, in regard to the variable position of the bulbus venae jugularis. In many cases the sinus sigmoideus curved into the vena jugularis without forming a bulbus. In other cases the bulbus lay higher than the deepest point of the sinus. When the bulbus was better developed, it reached the highest point of the pyramid and touched the cranial cavity with its thin walls, which were dehiscent in the neighborhood of the aqueductus vestibuli. The less developed bulbus was separated from the middle ear by a wall $^3/_4$-$^1/_2$ mm. thick. The better developed it was, the further it extended toward the medial wall of the middle ear, even above the oval window. The more extended the sinus was, the less developed was the bulbus, and the more prominent the sinus was, the better developed the recessus jugularis. This is principally because the waves of the blood in this case did not empty directly into the sinus, but spent their energy partially on the superior wall of the bulbus, and gradually hollowed this out more and more. In this way cochlea and semicircular canals were to a certain extent pushed forward. A highly developed sinus is predisposed to thrombosis, partially on account of the vicinity of the middle ear, on account of the possibilities of the formation of eddies and stasis. There can easily be complete thrombosis. The bulbus must be laid bare by operation. *Levy.*

A Case of Cerebellar Abscess After Injection Through the Labyrinth—Death from Meningitis—Autopsy.

Arnold Knapp. (*Archives of Otology*, XXXI, No. 2.) A man, aged 26, with left sided purulent otitis media of many years standing, became acutely ill, and suffered from severe headache and vertigo. The canal was stenosed and filled by a granulating mass projecting from ahove and posteriorly. No mastoid tenderness. Temperature 102.4° F. Pulse 110. Eyes normal.

On operation, a very much enlarged antrum filled by cholesteatoma was found. The posterior bony wall of the auditory wall is defective and filled with granulations. On their removal the facial nerve was exposed, and a large defect found in the anterior half of the external semicircular canal. The tympanum contains granulations but no ossicles. The oval window is enlarged and discolored granulations are seen in the vestibule. The external semicircular canal was removed and free communication with the vestibule established. The patient appeared to do well, and was allowed to leave the hospital, but about one month later, he suddenly became worse, had very severe headache, nausea, slight left facial paralysis and nystagmus on looking to the affected side. Temperature 101.4°. Pulse, 108.

The wound was re-opened and all granulations removed. Back of the facial nerve a wedge of bone covering the cerebellar dura was removed. A probe passed in various directions revealed nothing abnormal. The oval window was enlarged and promontory wall removed. The vestibule contained greenish granulations. The tegmen tympani was removed but dura was there healthy.

Six days later the patient's condition was decidedly worse, pulse rate dropped to 80. Then the posterior surface of the petrous bone was removed, and a healthy sinus exposed with the object of getting as near to the internal auditory meatus as possible; the semicircular canals and cochlea were removed. The cerebellar dura was incised horizontally, and the cerebellum punctured in various directions; congested meninges but no free pus found.

On autopsy, purulent meningitis of convexity and at base. The apex of left lobe of cerebellum adherent to dura on the posterior petrous surface at the risk of the internal auditory meatus. The pons, crura cerebri and 4th ventricle are bathed in pus. In the left cerebellar lobe in the region of the flocculus there is a small abscess cavity, 2x1$^1/_2$ cm., which seems to have communicated with or ruptured into the 4th ventricle. *Campbell.*

On the Value of Electrolysis in the Eustachian Tube.

PIERCE, Chicago. (*Archives of Otology*, Vol. XXXI, No. 4.) In a review of twenty cases the author came to the following conclusions:

1. In otosclerotic disease, electroloysis is useless.
2. In the great majority of cases of catarrhal disease, it has no advantages over other methods of treatment.
3. In a certain few cases where there is probably a soft exudate near the isthmus, it may be regarded as of some value. *Campbell.*

The Involvement of the Casserian Ganglion in Middle-Ear Suppuration.

HILGERMANN, Breslau. (*Archives of Otology*, Vol. XXXI. No. 4.) A well-known path of infection is one leading through the pneumatic spaces of the petrous bone. These pneumatic spaces, which in general are only found in the mastoid, may present an unusual development and may even occupy the entire pyramid.

Urbantschitsch described a case where fluid injected into a defect in the tympanic wall would appear in the cranial cavity at the apex of the pyramid.

The otitis media may lead to a phlebitis of the smaller blood-vessels, which pass from the tympanum through the cortico-tympanic canaliculi to the venous plexus surrounding the carotid.

The author cites cases where infection was carried by those paths. *Campbell.*

Toxemia from Suppuration in the Temporal Bone.

H. EULENSTEIN, Frankfort on Main. (*Archives of Otology*, Vol. XXXI, No. 2.) To eight similar cases recorded the author adds another. A child, aged 11, the previous year had suffered from typhoid. On coming under observation there was fever, pain in the neck and purulent discharge from the right ear. Membrane appeared on tonsils next day and antitoxin was employed. Five days later tonsils clean, temperature 40.1° C. Mastoid pain, profuse ear discharge. A measles-like rash appeared and as it faded away the temperature fell to almost normal.

Mastoid tenderness increased and temperature again rose. The mastoid was opened and found full of pus and granulations. The sinus was exposed for a distance of 3/4 cm. For two days subsequent to operation patient's condition was very satisfactory, pulse and temperature then rose. Sudden collapse and death.

Autopsy showed swelling of the spleen, edema of the lungs, a little serous infiltration of the brain and a small area of nodular infiltration in the wall of the lateral sinus.

Campbell.

Does Early Treatment of Acute Inflammation of the Middle-Ear Prevent the More Serious Complications?

MEIERHOF, New York. (*Archives of Otology.* Vol. XXXI., No. 1.) The author cites four cases as types of different classes of acute disease.

Free early incision of the Mt. relieves pain, and n children should be followed by a fall of temperature. Incision should anticipate rupture, and thus have drainage where it will be least interfered with. In a few cases owing to anatomic peculiarities and other conditions, in spite of our efforts, they will grow worse, and nothing short of complete exposure of the mastoid will suffice. *Campbell.*

The Inferior Occipital Plate of the Mastoid with Special Reference to Bezold's Mastoiditis.

JOHN DUNN, Richmond, Va. (*Archives of Otology*, Vol. XXXI., No. 2.) By inferior occipital plate of the mastoid is meant that part of the temporal bone which lies internal to the digastric groove, its posterior boundary being a line at right angle to the posterior end of this groove.

The plate is from one-sixth to one-fourth inch wide, and has a portion of the sigmoid sinus just above its inner table.

In a very considerable portion of cases the inferior occipital plate contains air cells connecting with those in the mastoid process. It is highly probable that purulent osteitis of this occipital plate with its air cells exists in the severer forms of Bezold's mastoiditis, and that the rupture takes place through its inferior, i. e., outer, table, and pus thus reaches the deepest structures of the neck.

This anatomic description of cells serves to explain why some operations for Bezold's mastoiditis fail, even though the entire tip and the cells above be removed. The cells of the inferior occipital plate when full of pus, because of the digastric groove, drain "up hill," unless the inferior table of the plate be perforated, in which case they empty into the deeper structure of the neck.

Campbell.

The Inmates of the Westphalian Deaf-Mute Institute at Soest, Prussia.

Denker, Hagen. (*Archives of Otology*, Vol. XXXI., No. 4.) Of 64 pupils the difficulty was congenital in 16, in 32 acquired, in 16 doubtful.

In the perception of pure tones, 25 were perfectly deaf in both ears.

Hearing tests:

1. Islands up to two and a half octaves in 31 ears among 21 children.
2. Tone gaps, 7 ears in 7 children.
3. Large defects in the upper part of the scale, with preservation of the whole lower-tone part, 4 ears in 3 children.
4. Larger defects in both upper- and lower-tone limits, 4 ears in 3 children.
5. Large defects in lower-tone limits with slight sinking of the upper limit, 3 ears in 3 children.
6. Small defects in both upper and lower limits, 15 ears in 10 children.

The result showed 16 pupils possessed sufficient hearing to be suitable for improved instruction; that is, the faculty of hearing tones from b^1 to g^2 was present. This, according to Bezold, is the range of the human voice.

Campbell.

On Diseases of the Ear in Hysterical Subjects.

Voss, Riga. (*Archives of Otology*, Vol. XXXI, No. 4.) The author's remarks, which can not be well abstracted, should be read in full.

He concludes that:

1. The objective picture of an acute otitis media may appear as a symptom of hysteria.
2. Pure functional neuroses of the ear should be treated not by an otologist but by a neurologist.
3. In these cases an absolute contra-indication exists against too much treatment, especially of the nose and pharynx.
4. The generally well-known craving of hysterical subjects for operations may also centre upon the ear (and probably also upon the nose).
5. Opening the mastoid process, to relieve the mastalgia of hysterical patients, is absolutely contra-indicated.
6. Our present method of after treatment of radical operations with prolonged tamponing is not at all suitable for children or nervous and hysterical patients. After the fifth day the tampon is entirely superfluous and should be replaced by a simple outer dressing. *Campbell.*

Dizziness.

PANSE. (*Zeitschr. für Ohrenheilkunde,* Band 41.) By dizziness we mean a deception as to our relation to space. This deception, or dizziness, either is felt as changes in the position of the body, or we refer the sensation to our surrounding. It seems as if the room moves forward or backward, or is distorted and rushes upon us. We base our judgment as to the relation of our bodies to space on sensation brought in over three paths: (1) The eye, (2) the organ of equilibrium in the ear, (3) from the muscles, joints and intestines. The author describes clearly the various peripheral and central paths which have a bearing on these functions. Every interruption anywhere in the path leads to a false judgment of position, and thence to dizziness. The value of the work cannot be justly shown in an abstract. *Levy.*

The Pathologic Anatomy of Deaf-Mutism.

SCHWABACH. (*Zeitschrift fur Ohrenheilk.*, Bd. 41.) The post mortem of a deaf and dumb patient showed on the temporal bone, in addition to an acute attack of miliary tuberculosis, a filling of the basal turn of the cochlea by a new growth composed partially of bone and partially of connective tissue. In addition to these, there was degeneration in the fibres of the cochlearis, in the ganglion cells of Rosenthal's canal, and defect in the fibers which led to the affected portion of the cochlea. The author thinks that a meningitis in fetal or early life led to an involvement of the labyrinth through the aqueductus cochleae. *Levy.*

What Means, other than Operative, have we in Preventing and Combating Inflammation of the Mastoid Cells.

SAMUEL THEOBALD (*N. Y. Medical Journal*, Sept. 13, 1902) takes the ground that while operation is necessary in advanced cases, proper internal treatment will in many instances prevent operation. As compared with the ophthalmologist the otologist is poorly acquainted with therapeutic remedies for ear disease. Non-operative measures for prevention of mastoid inflammation depends upon whether there is a chronic mastoiditis following inflammatory processes in the ear or following otitis media acuta. For the former, we are to control inflammation in antrum. Proper syringing will attain that end; a solution of bichlorid of mercury 1-8000 to 1-4000 is recommended, used daily at first but soon reduced to once a week, and internally phosphate of iron, quinin, strychnin, with aloin for constipation. Under this treatment "the ear remains for weeks or even months without requiring attention.

In acute otitis, energetic measures will obviate necessity of paracentesis. Locally atropin 4 gr. to ounce and cocain (alkaloid) 8 gr. to ounce of oil of sweet almonds are employed. Internally calomel, scammony and rhubarb and the pyrophosphate of sodium in full doses. As valuable a measure as is paracentesis, can be done needlessly, and is liable to open up a channel of infection.

Even when mastoid involvement is diagnosticated, operation can be prevented. Beside free paracentesis, active purgation as just mentioned and mercury for its systemic effects are advised, given in form of calomel one-fourth to one-half grain every hour to two hours, supplemented by inunctions. No cases of the author are reported, but one by Buck is quoted where success followed such a course of treatment.

[The author's experience is at variance with that of most of us in his successful treatment of chronic suppurative otitis, and the constant menace to life of an uncured otorrhea should never be lost sight of. The suggestions for treatment of acute otitis are certainly new and worthy of careful consideration. ABSTRACTOR.] *Harris.*

Mastoid Disease in Infants; two Cases in Adults, the two Latter Complicated with Erysipelas.

W. PYRE PORCHER. (*N. Y. Medical Journal*, Oct. 4, 1902.) The two cases occurring in infants are interesting because only a free incision was made into the large abscess behind the ear, without curetting, but with complete recovery in three and eight weeks respectively. This proceeding is quite at variance with the usual method of removal of all diseased tissue. *Harris.*

The Constitutional State Versus Catarrhal Deafness.

SARGENT F. SNOW (*N. Y. Medical Journal*, Oct. 11, 1902.) makes an earnest plea for a careful attentiveness to all constitutional disorders as a necessary preliminary to successful local treatment to ears; cold baths, silk or wool underwear, a healthy liver, correction of constipation, and all stomach troubles, as well as uric acid and urethral disorders. Vigorous exercise is desirable—such as active arm exercises. In addition all defects in the nose should be relieved. *Harris.*

Accommodation in the Human Ear.

HENSEN. (*British Medical Journal*, Dec. 21, 1901.) Tuning fork is sounded; instrument is made to click; after each click a wave-like increase of the fork note is perceptible, as with other short sound impressions. This might be contrast or accommodation of both. Contrast was excluded as follows, by biting finger or soft object during fork vibration. Increase of note occurred always with the rhythm of the voluntary movement. He attributed this phenomenon to a simultaneous contraction of the accommodation muscle. Further a sounded note did not disappear immediately but recurred one or more times after the sound had stopped. *Wyatt Wingrave.*

Two Cases of Abscess in the Sphenoidal Lobe Presenting No Lesions in the Ear.

LEES. (*Lancet*, May 3, 1902.) Case 1. Girl at 6 years had frontal headache and earache, with occasional vomiting, right optic neuritis, tenderness over right forehead No paralysis. Ears were normal. Death sudden.

Abscess contained 2 oz. green inodorous pus in right temporo-sphenoidal tube; caries of roof of bony meatus one-half inch from tympanum one-fourth inch in diameter; mucous membrane lining meatus and rest of auditory apparatus normal. Pus yielded pure culture of streptococcus pyogenes.

Case 2. Girl 21 months. Suffered with pain and vomiting 3 months. Lost use of limbs after a fit. Drowsiness; left hemiplegia, double internal squint but no optic neuritis, death.

Small abscess in right temporo-sphenoidal lobe, basic meningitis; middle ear healthy. Small portion of diseased bone almost size of three penny piece above the tympanum.

[Although the tympanic membrane and the rest of the auditory apparatus is described as being healthy the presence of caries in tympanum and meatal roof is strongly suggestive of past disease. The absence of any examination for tubercle is to be regretted. ABSTRACTOR.]

Wyatt Wingrave.

Chronic Otitis Media Followed by Suppurating Bursitis.

BRANSON (*British Medical Journal*, Feb. 8, 1902.) Case of a male, aged 27, subject to ear discharge 20 years. Had appendicitis followed by acute suppuration of the subscapular bursal sac and the corresponding shoulder joint. It was interpreted as a staphylococal infection secondary to ear trouble. *Wyatt Wingrave.*

Optic Neuritis with Paralysis of Both External Recti Following Suppurative Disease of the Middle Ear.

COLLIER. (*Medical Press*, June 11, 1902.) The Pathology of the condition was attributed by Dr. Hawthorne to thrombosis of cerebral veins and sinuses.

Wyatt Wingrave.

Case of Brain Abscess Following Chronic Suppuration of the Middle Ear.

WOODS. (*Medical Press*, June 11, 1902.) Abscess in cerebellar fossa (subdural) evacuated, followed by abscess in temporo-sphenoidal lobe which was also evacuated; recovery. *Wyatt Wingrave.*

Labyrinthal Suppuration.

V. HINSBERG (*Zeitsch. f. Orenheilk*, Bd. 40) gives from the previous literature and a number of cases observed by himself, a useful clinical exposition of complication of the labyrinth in otitis media suppuration. The first etiologic feature is trauma, both fractures of the base, and intentional or accidental opening of the labyrinth capsule during operation. Of the cases of stapes extraction for the betterment of hearing, only one led to a mild infection. More dangerous than the intentional is the accidental injury to the labyrinth (horizontal semicircular canal and fenestra ovalis), especially by unskilful attempts to remove foreign bodies. After an injury to the horizontal semicircular canal, there usually appear symptoms of irritation which last only a short time. Among 67 cases of perforation of the labyrinth by pus, the entrance was 17 times through the fenestra ovalis, 2 the fenestra rotunda, 3 both, 27 the horizontal semicircular canal, 5 the posterior canal, 7 the labyrinthal wall. On an average there is one fistula of the semicircular canals to 100 chronic otitis suppuration. Infection of the labyrinth after acute suppurations are very seldom, usually after scarlet fever. In many cases the suppuration is confined to sections, especially to one semicircular canal. The labyrinthal symptoms depend on (1) the collection of pus, as such (2) symptoms of affection or irritation of the end organs of the nerve. The fever usually remains low, often is entirely absent. Hearing is absent in very pronounced labyrinthal affections but can be surprisingly good, however, when this is a localized process.

Dizziness is a very frquent symptom, but can eventually disappear. The symptoms of irritation are subjective noises, nystagmus, uncertain gait, unequal pupils, headache, nausea and vomiting. Labyrinthal suppuration sometimes heals, even without treatment with normal or slightly defective hearing. Often, however, meningitis supervenes. A cranial complication was present in 108 out of 198 cases, 43 times the path of the infection could be demonstrated, 25 times it was through the porus acusticus internus; once through this and the aqueducts; 8 times through the aqueductus vestibuli; once through the aqueductus cochleae; 8 times through a fistula in the vertical semicircular canal. In 92 cases there was cure, in 60 meningitis, in 6 meningitis and brain abscess, in 13 cerebellar abscess, and 25 times death followed from other causes. In some of the cases a favorable effect was caused by the operations, but sometimes meningitis followed close upon it. Nevertheless the author recommends operation in certain cases of labyrinthal suppuration, but by means of the burr instead of the chisel on account of the danger of concussion of the brain. He describes a method of doing this without injuring the facial nerve. In his experience, the good results of the operation outweigh the danger connected with it. *Levy.*

Four Cases of Meniere's Symptom Complex.

R. BYLSMA. (*Monatschrift f. Ohrenh.*, 36 jahrgarg, No. 2.) The author carefully describes the anatomical substratum of the disease. It was due in one case to a temporary closure of the tube and disappeared after a single catherization. In the second case there was acute labyrinth affection, with cure by general treatment. In the third case there occasionally appeared dizziness, nausea, difficulty in hearing and unbearable noises. The hearing at other times was intact. The cause was an acute glaucoma, with cure by treatment with eserin. The fourth case was due to middle-ear disease. Installation of pilocarpin and massage relieved the dizziness.

Levy.

The Treatment of Chronic Dry Catarrh of the Middle-Ear by the Pneumatic Chamber.

HAMM (*München. Med. Woch.*, 1902.) had used the ordinary methods of treatment on himself and his patients without any result. He then treated eight cases by making them sit in the pneumatic cabinet. In every case there was a favorable influence on the hearing and tinnitus. In three cases the result was lasting. The length of treatment was one and one-half hours, of which 25 minutes was occupied in increasing, and 40 minutes in decreasing the pressure. The pressure was first one and a half, later two and a half atmospheres. Number of treatments 25–40. The author desires further tests.

Levy.

The Involvement of the Casserian Canglion in Otitis Media Suppurativa.

R. HELGERMANN (*Zeitsch. f. Ohrenheilk.*, 40 Bd.) directs the attention to a path hitherto little observed, by which pus can reach the meninges from the middle-ear.

The root of the trigeminus passes under the attachment of the tentorium cerebelli through a wide space in the dura. The gasserian ganglion lies extradural, near the point of the pyramid, in a shallow excavation. A suppuration can involve the gasserian ganglion, and secondarily the meninges by infection of the pneumatic spaces, which often extend to the inner surface of the cranium and the point of the pyramid. In addition to several doubtful cases, the author found two indisputable ones where the infection took this path, and reports a similar one from Breslau Clinic. Moreover, the plexus carotidum, and from this the plexus sinus cavernosum with which it communicates, can also be infected. On account of the relationship between the sinus and the gasserian ganglion, whose inner portion touches the outer wall of the sinus, a way of infection is here possible. An undeniable case of this kind could not be shown. *Levy.*

The Theory of Cross Education as Applied te the Auditory Apparatus.

LEWIS S. SOMERS, Philadelphia, Pa. (*Amer. Jour. Med. Sciences*, Oct., 1902.), has made a number ·of experiments on cases of so-called sclerotic or catarrhal otitis media to ascertain whether treatment of one ear causes improvement of the opposite ear. He has found this to be the case to a certain degree, and has observed clinically that in many instances there is an improvement in the hearing of the non-treated ear at the same time with the treated one in cases where only one is treated. An improvement has also been noted in connection with tinnitus, the principal treatment here being massage. The cross relationship between the ears probably depends upon some anatomic and reflex connection, either through the sympathetic and cranial nerves or through the decussation of the auditory fibres within the brain. The original paper is well worth careful study. *Richards.*

Tinnitus Aurium.

G. GRIFFIN LEWIS, Syracuse, New York, (*Philadelphia Medical Journal*, June 28, 1902). reviews the various causes that produce or are supposed to produce tinnitus aurium, together with the details of the examination to determine the cause and the various remedies used for the condition. The very number of the remedies shows how unsatisfactory in the main is the treatment of this condition, and how seldom we either ascertain the true cause, or having ascertained it, are able to remove it. In the author's experience he has found massage with a mechanical masseur to be more effective than any other treatment, especially for those cases in which there are ankylosed or adherent ossicles. *Richards.*

Fetal Disease of tho Labyrinth Following an Encephalitis Hemorrhagica.

H. HAIKE. (*Arch. f. Ohrenh.*, Bd. 55.) It has never been possible to determine the etiology of congenital labyrinthal affections which cause deaf-mutism. Although it was formerly thought that the labyrinthal changes found post mortem in deaf-mutes, such as ossification of the labyrinth and cavity formations, were developmental anomalies, we now know that, usually, the cause is a fetal labyrinthitis. It was deemed probable in many cases that the brain was the starting point, but proof was lacking. This is furnished by Haike. The post mortem of a four-day-old child showed a complete destruction of the cerebral hemispheres, with plain traces of a previous hemorrhagic inflammation. In the temporal bone was found a destruction of the nervus cochlearis in the inner auditory meatus, caused by hemorrhage. In addition to this, there were hemorrhages in the cochlea, especially in the scala tympani, and degeneration of the cells of the ganglion spirale. A further development of the process would certainly have led to the changes found on deaf-mutes. *Levy*

The Predisposition to Aural Affection in Children Caused by Tubercular Ancestry.

OSTMAN. (*Archiv. f. Ohrenh.*, Bd. 55.) Ostman's extensive tests on public school children show that the descendants of tubercular ancestors are affected more often and more severely by aural diseases than others are. The greater the inherited taint, the oftener and severer is the disease. *Levy.*

Tuberculosis and the Ear.

KLUG. (*Ungar. Med. Presse*, No. 24, 1902.) Tuberculosis of the ear occurs usually as a chronic suppurative process of the middle ear, developing secondarily to tubercular processes in other organs. An infection occurs most commonly through the Eustachian tube, probably during the act of coughing, though it may also take place through the external meatus, when a previous perforation of the drum membrane has existed. It may finally arise through infection by the way of the lymph channels and blood vessels.

Tuberculosis of the drum membrane is rarely seen in its early stage. In one instance, observed by Habermann, tubercles were found on the drum membrane, occurring as yellowish, slightly-prominent specks, rapidly disintegrating, and leading to complete destruction of the membrane.

Not every discharge from the ear in phthisical individuals is tubercular, and, even in suppurations of undoubted tubercular origin, the demonstration of bacilli is frequently difficult.

The most characteristic symptom is pain, with the absence of reaction. A variety of complications may occur, occasioned by the extension of the ulcerative process. At times, especially in scrofulous children, the process runs a more rapid course, with more abundant granules. Osseous sclerosis is observed, and there may be an apparent healing of the process in the bone, covering over with firm epidermis.

Prognosis is more unfavorable in young individuals. Where tuberculosis of the lungs exists, operative treatment is less productive of favorable results.

Treatment consists first in freeing the middle ear and allowing the escape of the discharge. The best results are attained in suitable cases by radical operation, which should be done as early as possible.

Patients with middle ear discharge should be properly instructed how to introduce cotton into the ear, and should learn the importance of destroying everything which comes in contact with the discharge for the purpose of preventing an extension or transmission of the infection.

Goodale.

Hysteria Following Otitis Media Acuta.

UNGAR. (*Med. Presse*, No. 12, 1902.) Szenes, a woman 23 years of age, was taken with acute inflammation of the middle ear, accompanied with severe pain, requiring paracentesis. During convalescence, severe pains recurred, which did not yield to aspiration or inflation of the ear. Two days later, severe headache, nausea and vomiting, with left-sided orbital pain, supervened. Examination was otherwise negative. In consultation, a diagnosis of hysteria was made, which yielded only after four weeks' appropriate treatment. *Goodale.*

II.—NOSE AND NASO-PHARYNX.

Some Modifications of the Author's Original V-Shaped Operations for Correction of Deflection of the Septum.

D. BRADEN KYLE, Philadelphia. (*American Medicine.* May 31, 1902.) This operation has already been described and illustrated. Modification consists in the use of a V-shaped file saw originated by Dr. George Fetterolf, and described in American Medicine, March 1st, 1902. Dr. Kyle, finds that this instrument removes the V-shaped piece in many instances better than his own small curved saw previously described. Otherwise the operation is unchanged. *Richards.*

Empyema of the Antrum of Highmore, with Ptosis and Diplopia. Understudy of Treatment on the Ocular Disturbances.

(*Medical Record*, June 28, 1902.)

Pathology of Empyema of Highmore.

H. N. HOOPLE, Brooklyn. (*Medical News*, Aug. 16, 1902.) In the first article the author records two cases of empyema of the antrum treated by the anterior end of the middle turbinate. The first one is of interest on account of having had severe troublesome hemorrhage on several occasions. Recovery took place on the establishment of good drainage, from natural opening without further operative procedure.

The second case had considerable tenderness over the malar bone, with very bad smelling pus, and also a history of hemorrhages.

In the second article a review of the pathology and literature of antral empyema is given. The author evidently does not believe that exploratory puncture and irrigation are justified in a case that is apparently getting well, no matter what might be missed in diagnosis thereby; and thinks that spontaneous recovery can take place even though one has never seen it, and quotes various authors in proof that this does occur.

(So far as exploratory puncture is concerned, the reviewer regards it as always justified whenever diagnosis is in doubt; and thinks that cases which get well spontaneously would get well much more rapidly if the cavity were washed out by means of a hollow exploring needle. The procedure is not especially painful, and has few contraindications.) *Richards.*

Rhinoliths and Foreign Bodies in the Nose.

J. M. INGERSOLL, Cleveland, O. (*Medical Record*, Apr. 12, 1902.) After considering the general subject of foreign bodies, the writer reports an interesting case of rhinolith that formed around a bean, and which at the time of removal weighed two grams. It had produced entire obstruction of the left nasal fossa for thirty years, with broadening of the left side of the nose and a pushing of the left nasal bone forward and upward. It was an irregular, jagged formation, and was removed in many pieces with the aid of forceps. On being shown the bean, the patient remembered having put one into his nose when he was a small boy.

He also reports the removal of a much smaller rhinolith from the left nasal fossa of a young lady. This had been in existence several years, and its nucleus was a pea.

Richards.

Maxillary Antral Suppuration, with a Report of a Case.

LINN EMERSON, Orange, N. J. (*Amer. Medicine*, Apr. 19, 1902.) This was an acute case in which natural drainage was brought about by shrinking of the tissue around the natural outlet with adrenalin and by having the patient assume the proper position. Douching affected a cure in in a few days. *Richards.*

Adenoma of the Nose, with Incipient Sarcomatous Metamorphosis.

EMIL MAYER, New York. (*American Medicine*, Aug. 2, 1902.) The patient a man of 68, had been under treatment for six years for numerous polypi, with a suspicion that the growth had become of a sarcomatous nature, and was referred to Dr. Mayer for radical operation. The left side of the nose over the nasal bones was distended, and a large tumor presented on the left side of the nose, while both nostrils were occluded. The tumefaction was soft and yielding to the touch, but not painful, and the mouth was habitually open. The mass extended into the posterior nares. It was impossible to determine how much of the superior maxilla was involved. A diagnosis of a myxomatous tumor with probable malignant change was made and a radical operation determined upon. Tracheotomy was first performed and the patient anesthetized with chloroform through the tube. The posterior nares and the mouth were packed with gauze. "An incision was made, beginning near the inner canthus of the left eye and close to the edge of the tumefaction, brought around close to the alae and down to and through the median line of the upper lip. The mucous membrane of the nose which was intact was cut through and the nose drawn aside with retractors. The slight bleeding was checked with artery clamps. An immense growth now presented, which was thoroughly evulsed by means of forceps and curette. It was found that the whole mass had originated from the left middle turbinated bone and this place was thoroughly cauterized. There was entire absence of the vomer, the nasal bones on the left, and most of the superior maxilla that formed the hard plate. The cartilaginous septum was not affected, while the bones had entirely absorbed. There was no evidence, however, of involvement of the bone, so far as the growth was concerned; hence no part of the superior maxilla was removed. The nose was now brought back to its original position, the parts coapted and sutured, plugs removed from the mouth, but not from the posterior nares; the tracheotomy tube left in situ, and the patient put to bed. There was no subsequent hemmorrhage and some of the packing was removed each day, until on the fifth day no further packing remained. The alae having a tendency to fall in, two Mayer tubes were introduced. On the tenth day the tracheotomy tube was removed and the wound healed slowly by granulation. The nose was cleansed frequently with sprays. At the end of the third week the nasal tubes were removed and he was discharged from the hospital cured, with very little cicatrization showing, breathing freely through both nostrils, and from being an object of abhorrence and pity is now a useful member of society in his sphere of life, and as he puts it "a new man and a happy one."

Histologically the growth proved to be an adenoma with incipient sarcomatous metamorphosis. *Richards.*

Chronic Empyema of the Frontal, Ethmoidal, and Both Sphenoidal Sinuses.

JOS. H. BRYAN, Washington, D. C. (*American Journal of Medical Sciences*, Sept., 1900.) Patient was a woman of 48 years, who was under observation for three years with extensive necrosis of the sinuses named, probably complicated with an adenoma of the posterior ethmoidal and sphenoidal regions. She was operated on at various times, with partial relief and temporary subsidence of symptoms. After many attempts the adenomatous growth was finally entirely removed; and for an interval of one year there was no return. The suppurative inflammation finally disappeared, and at the time of report there was only one small cell in the posterior ethmoidal region where pus is formed. *Richards.*

Syphilitic Necrosis of the Nasal Cavity, Accompanied With Total Blindness.

CHARLES A. TODD, St. Louis, Mo. (*Philadelphia Medical Journal*, Sept. 20, 1902.) A case of tertiary syphilis in a man of 47, in which destruction of the bony portion of the nose had been going on for several years and was finally accompanied by marked diminution of the field of vision, the power of central vision, with atrophy of the optic disc. Healing of the nose and improvement of the eye conditions took place under large doses of iodide potassium and of protodide of mercury.
Richards.

Acute Empyema of Frontal Sinus—Operation, Death.

VON WILD, Frankfort, A-M. (*Archives of Otology*, Vol. XXXI, No. 4.) A healthy young woman was taken suddenly ill with coryza and left frontal headache. Temperature 39° C. Vomiting set in the following day. Examination of the nose revealed a yellowish-white discharge at the left infundibulum. Transillumination of sinus negative. Cocain lessened the turbinate swelling and pus discharge was free. Temporary improvement was followed by an aggravation of symptoms. Delirium, left mydriasis, upper eyelid edematous. The sinus was opened, yellowish-green odorless pus evacuated. The mucous membrane at the upper and inner corner was thickened, infiltrated and discolored. No bony defect could be discovered. In the posterior wall a window was made; the dura seemed tense but on incising it no cerebro-spinal fluid escaped. Punctures made into the brain were negative. Coma set in. Petechial hemorrhages appeared at the ankles. Death. No autopsy was permitted. *Campbell.*

Changes in the Blood Vessels of the Nasal Mucous Membrane in Nephritis.

SCHONEMANN (*Archiv. für Laryngol.*, Bd. 12) found, in 8 patients who died of nephritis, changes in the nasal mucous membrane which he regards as typical, on account of their constancy. Often, the nasal mucous membrane was seen, macroscopically, to be yellowish, discolored and covered with brownish spots. Microscopically, it was found that the number of capillaries lying near the epithelium had increased; that, in many places, they had broken through the basal membrane, and that solitary loops of capillaries had forced their way between the basal epithelial cells. The capillary wall and epithelial covering easily ruptured, and blood flowed out of the capillaries onto the superficial surface and into the mucous membrane. The capillary walls did not seem much changed, nor did the larger, deeper vessels. The author thinks that the toxins circulating in the blood of the nephritic patient makes the vessel wall more fragile. *Levy.*

The Probing of the Ductus Nasolacrymalis from the Nose.

L. POLYAK. (*Archiv. für Laryngol.*, Bd. 12.) The probing of the lacrymal passages often gives the oculist much trouble, principally because the sclerosis usually lies in the membranous portion, and the narrow, bony canal allows the passage only of small probes. For this reason, several oculists have tried probing through the inferior opening. For this purpose, the author has made the attempt in numerous cases, with an instrument specially constructed with respect to the anatomical conformations, and recommends that it be tried a great number of times. Usually it is necessary to excise the anterior end of the inferior turbinate. Then it is always possible to penetrate 15 to 20 millimeters into the passage with the instrument, whose inferior arm should be bent at nearly a right angle, and have a thickness of 4 mm. It was possible in every case to introduce the largest size, even the first time. Under cocain, the procedure gives little pain. It is indicated when the disease is of nasal origin, and when the stenosis is in the inferior portion of the passage, and when there is no very severe affection of the lacrymal sac. *Levy.*

Clinical Contribution te the Study of Empyema of the Frontal and Ethmoidal Sinuses, Complicated by Eye Disease.

MAX TOAPLITZ (*N. Y. Medical Journal*, Sept. 6, 1902) reports a case of sinusitis frontal occurring in a man of 48. The patient had a history of a previous attack 4 years before. When seen by the writer, he complained of severe pain in right forehead. Pus was seen in the nose. A curettage of the ethmoid was performed. Great swelling of eyelids followed almost immediately. Incisions into lower lid failing to find pus, an external operation on sinus was performed, with removal of pus, polypus and carious bone. The extreme swelling of lid was not relieved, even by a subsequent incision, and spontaneous bursting evacuated considerable pus. Subsequent recovery uneventful. Toaplitz is inclined to advocate the intranasal method of operation as a conservative and preliminary method of treatment, resorting to the external operation later, if necessary.

[Experience is beginning to show us that the latter method, in chronic cases, is the wiser, as it certainly is the safer one to pursue, even from the start.—ABSTRACTOR.] *Harris.*

Ethmoidai Mucocele in a Man Aged 26.

BOWLBY. (*Lancet*, May 3, 1902.) There was history of nasal obstruction and of swelling in the left orbit. Turbinals were removed, but swelling increased with displacement of left eyeball. *Wyatt Wingrave.*

Congenital Absence of Nose and Anterior Nares.

WYNTER. (*Lancet*, May 3, 1902). Female, six weeks old; first child of healthy parents. No hare lip and premaxillæ perfectly developed. There was difficulty in suction and respiration. No cleft palate present.

Wyatt Wingrave.

Treatment of Chronic Suppuration in Frontal Sinus.

LACK (*Edinburgh Medical Journal*, June, 1902) advocates intranasal treatment as a necessary preliminary to the external. There is not much danger in letting alone, after establishment of free drainage. He prefers supraorbital incision. Infundibulum should be cleared, a large rubber tube passed into nose, the upper end fixed to inner angle of incision and the rest of wound sutured. This should be replaced by vulcanite plug with shoulder resting on supraorbital margin and removed once daily and syringed. *Wyatt Wingave.*

The Treatment of Hay Fever.

A. SIMON. *(Deutsche Med. Woch.*, 1901, No. 28.) In a case of hay fever which appeared every summer for nine years, a prompt relief was obtained by the use of atropin sulphate. The nasal and conjunctival catarrh was not influenced by treatment. *Levy.*

Case of Primary Nasal Tuberculosis.

HALASZ *(Ungar Med. Presse*, Nos. 9 and 10, 1902) reviews the literature of the subject, with regard to infection and diagnosis, and reports the case of a woman, 40 years of age, who came with a history of catarrh of 6 months duration, accompanied by frequent nosebleed and a swelling of the bridge of the nose. Examination showed a diffuse reddening and infiltration of the nasal vestibule, together with a perforation of the cartilaginous septum, bordered by an infiltrated margin, together with granular excrescences on the floor of the nose, which extended over the lower turbinates to the posterior nares. A specimen was excised from the lower turbinate, and showed a granuloma upon a tubercular basis. *Goodale.*

A New Treatment for Hay Fever and Allied Complaints.

E. FINK *(Deutsch. Med. Woch.*, 1901, No. 46.) regards this affection as a secretory neurosis of the nasal mucous membrane, due to changes in the endings of the trigeminal secretory fibres. He thinks he has proven that the secretion comes only from the neighboring cavities. Since then he has directed his therapy toward the antrum of Highmore, with treatment of the general neuropathic condition in addition. Good results were obtained by insufflation of aristol. *Levy.*

III.—MOUTH AND PHARYNX.

A Fatal Case of Acute Primary Infectious Pharyngitis with Extreme Leukopenia.

PHILIP KING BROWN, San Francisco. (*American Medicine*, April 19, 1902.) Patient was a female, aged 29, with a family history of tuberculosis. She had been operated upon for lacerated cervix and perineum, having left the hospital three weeks after, well established in convalescence; but the third day after reaching home she arose and went down stairs barefooted, clad only in her night dress. This was followed by chilly sensations, pulse of 120, temperature 103, and with sore throat. On examination the pharynx and tonsils were reddened, the latter slightly swollen. There was no membrane or pain on swallowing. Symptoms became rapidly worse; temperature went to 105, the throat became dark red, and the left tonsil more swollen. During the next few days edema and swelling of the tonsils continued until it became so great that it was decided to examine thoroughly for possible pus formation. Scarification was decided upon because of the suggestion of fluctuation on palpation. This was done on the sixth day, but with negative result. An agar tube inoculated with the knife used for the incision showed staphylococcus pyogenes albus and aureus. After this a membrane formed over the wound area and persisted until death, which occurred from edema o the glottis of very sudden onset on the seventh day. Diptheria antitoxin was given, but without result. Autopsy showed the presence of staphylococcus pyogenes albus of pure culture from the blood of the heart, the bone marrow of the femur, epiglottis and the left kidney. The right kidney and uterine wall showed bacillus coli communis, and the uterus, bacillus coli communis and staphylococcus albus; showing the most extensive general infection. *Richards*,

Six Cases of Operation for Cleft Palate.

C. A. PORTER, Boston. (*Boston Medical and Surgical Journal*, Feb. 6, 1902.) These varied in age from 9 months to 35 years, and in five of the cases good results were obtained. Chloroform anesthesia is preferred to ether, owing to the more quiet breathing and the absence of mucous. The whole cleft is carefully and completely denuded by grasping the tip of the uvula with fine forceps and cutting from before backward, on each side, a continuous strip of mucous membrane about one-eighth of an inch wide. If the edge of the flap appears too thin it may be split for one-eighth of an inch before suture, thus getting a broader surface for approximation. Two lateral incisions are made from the level of the canine teeth, close to the margin of the alveolar arch, back to and through the fan-like expansion of the tensor palati muscle. This avoids tension on the stitches of the soft palate, and after healing, the tensor palati resumes some of its functions. The levator should not be cut. The edges to be sutured should never be crushed by grasping with forceps, and all tension must be avoided. Care must be taken to use no more stitches than are necessary, and they must not be tied too tightly, which is the usual rule, owing to the difficulty of tying in such a small space, and to the almost invariable struggling under the anesthesia. Swelling follows, and the sutures, which at the operation appeared loosely tied, are found to be cutting on the second day. The author places the stitches three-eighths of an inch apart, and the same distance from the edge of the wound. He prefers silk, previously soaked in Balsam of Peru. He removes all the stitches at the end of a week. In the case of young children the child is held firmly in bed, on its back, with a swathe. The hands are confined at the wrist by a band pinned to the swathe in such a way that while a certain amount of action is possible, neither hand can reach the mouth. Both nostrils are plugged with cotton wool as soon as the child recovers from the ether in order to bring about mouth breathing, as this causes the palate to remain dry instead of moist, and there is less maceration. The confinement causes the child to be very restless and fretful, requiring most careful nursing. It is kept from crying by small repeated doses of bromid and chloral or deodorized tincture of opium. Saline nutritive enemat are given every six hours, and not until the fourth or fifth day are liquids given by the mouth. The after treatment is important. Adhesions about the palate should be divided, and the soft palate excised, massaged and made movable by voluntary contractions in adult cases, and by passive motion and stretching with the finger in children. The power of good speech is almost always in direct ratio to the time spent in instruction and the intelligent effort of the patient. *Richards.*

Anomalous Position of the Common Carotid, Visible in the Pharynx.

GEORGE B. WOOD, Philadelphia *(American Journal of the Medical Sciences*, Sept., 1902), has seen two cases of pulsating artery on the right side of the pharynx. In one of them the beat of the right carotid could be readily traced from above downward, beginning at a point about one-quarter of an inch above the upper edge of the thyroid cartilage. On the right side of the pharynx, projecting at times almost to the median line, was a large pulsating blood vessel about the size of a leadpencil; and by forcibly depressing the tongue this bloodvessel could be seen running from below upward and slightly inward until it reached a point about opposite the uvula, where it took a course slightly outward and upward. The patient was a child of five, and the condition was discovered by accident.

In the second case, which was in a boy about seven, the findings were substantially the same. *Richards.*

Hypertrophy of the Lymphoid Tissue at the Base of the Tongue as a Cause of Cough.

HERMAN JARECKY, New York. *(American Journal of the Medical Sciences*, July, 1902.) Twelve cases are reported, all of which were improved by treatment. Excision of the lymphoid tissue with the tonsillitome of Myles gave the best results. *Richards.*

Tumor of the Pharynx: An Accessory Thyroid Gland. Removal Followed by Myxedema.

E. L. SHURLEY, Detroit, Mich. *(Philadelphia Medical Journal*, Sept. 13, 1802.) Patient was a girl 16 years of age, with good family history, annoyed by progressive desire to swallow and some difficulty of deglugitition while eating. Examination showed a dark-red, globular, smooth, broadly pedunculated tumor about the size of a small hen's egg, attached well down at the very base of the tongue, a little to the right of the median line and close to the epiglottis, but not infringing much upon that structure.

Under chloroform anesthesia, the tumor was removed by means of a heavy wire snare. Considerable hemorrhage was encountered, requiring constant attention for two hours, and was controlled by a gauze compress saturated with an adrenalin solution held over the site of the growth by the fingers. Three weeks after removal she showed well-marked signs of myxedema, such as swollen skin, especially ahout the eyelids, mental dullness and physical debility. Under two to five-grain doses of thyroid gland given three times a day, there was rapid improvement.

Richards.

Keratosis of the Pharynx.

Chas. W. Richardson, Washington (*American Journal of the Medical Sciences*, Oct., 1902), regards the condition commonly known as mycosis pharyngea leptothrica to be not mycosis at all, but a keratosis, and that the presence of the leptothrix is rather an accidental deposit and without causative relation to the structural changes. Structurally the tufts are found to be small, tough, horny-like in hardness, firmly adherent to the mucosa, from which they can be separated only with difficulty. When forcibly removed they rapidly reproduce. They are more frequent in Waldeyer's lymphatic chain, although the condition is not limited solely to this region. The growth is most abundant on or about the tonsils and at the base of the tongue. They are observed also on the pharynx wall, glosso-epiglottic folds and fossæ. Examination has shown the masses to be made up of a central narrow lumen containing bacteria, detritus and mucus, surrounded by an epithelial wall, composed partly of layers of hardened, unnucleated epithelial cells and partly of a homogenous, horny substance. Attention is drawn to the work of other observers corroborating these opinions. The author's report is preliminary to a more full report along the line of the scientific study of the etiology and pathology of this disease, which he is making and which is to be published later. *Richards.*

Angina.

V. Uy (*Ungar. Med. Presse*, No. 22, 1902) recommends, in cases of angina, aspirin in 3-grain doses, taken as soon as the first symptoms are noticed. *Goodale.*

Contribution to the Statistics of Carcinoma of the Tongue.

K. Rodiger (*Beitrag. z. Klinic. Chir.*, Bd. 31) has considered, from a statistical and clinical standpoint, the 31 cases treated in the Heidelberg Surgical Clinic in last 13 years. 19.35 per cent. were women. Age of the patients between 37 and 80 years, most of the patients between 46 and 50 years. Metastases were found in 22 cases, but only in the neighboring parts. Of importance is the fact that in carcinoma of one-half the tongue, the glands on the other side, and even the cervical glands, may be infected. Nevertheless, only the swollen glands were excised. Only one case of carcinoma was inoperable. The six cases operated on with the galvanocautery gave somewhat better results than those operated on with the knife. In 7 cases a lasting result was obtained, and the more extensive operations turned out better than the single ones. *Levy.*

Chancriform Ulcer of Tonsil, or Vincent's Angina.

THOMSON. (*Lancet*, May 3. 1902.) Boy, aged 12 years. Sore throat 4 days. Oblong gray slough on right tonsil, which was easily detached. *Wyatt Wingrave.*

The Curability of Pharyngeal Tuberculosis.

JULIUS VEIS. The author had the rare experience of observing 5 cases of pharyngeal tuberculosis. In some of them pulmonary tuberculosis was present. Only in the first case was the diagnosis confirmed by the anatomic examination. In every case there were large ulcers, without tumors. The diagnosis from gumma and carcinoma usually was not difficult. For treatment, he used concentrated trichloracetic acid about every 4 or 5 days. To stop the pain, he employed 10 per cent. orthoform powder. In this way he obtained a cure in every case, with slight cicatrization. *Levy.*

IV.—LARYNX.

A Case of Intratracheal Colloid Struma; Operation; Recovery.

CLEMENT F. THEISEN, Albany, N. Y. (*American Journal of the Medical Sciences*, June, 1902.) Patient was a woman of 32 years of age who had a goitre of moderate size. On examining the larynx a tumor of considerable size was found springing from the posterior and left lateral walls of the trachea, almost completely filling its lumen. It was regular in outline and covered with a perfectly smooth, normal-looking mucous membrane. Operation was done on account of the severe dyspnea, and was especially difficult, on account of the enlarged thyroid isthmus, making it unwise to do the preliminary low tracheotomy. The exposure of the trachea was difficult, and a high tracheotomy had to be done early in the operation. The trachea being exposed a low tracheotomy was then performed, the upper tube taken out, and the tracheal rings above the tube split, as was also the cricoid. The tumor, which was over five cm. long, extended from the first tracheal ring downward along the posterior wall, and almost filled the tracheal lumen. It was firmly attached by a broad base to the posterior and left lateral walls of the trachea from which it could not be separated. As much of the growth was removed as was possible with snare and curette, adrenalin solution being used continuously on account of the severe and troublesome hemorrhage. On account of this latter and because of the condition of the patient, it was found impossible to entirely remove the portion of the tumor attached to the posterior wall. The tracheal wound was sutured with catgut. During the process of convalescence the patient had double pneumonia during which nitroglycerin 1/30 gr. was given every hour, with 1/30 gr. of strychnin every three hours. A condition of extreme collapse followed, during which hypodermic injections of 1/20 of a grain of nitroglycerin were given every twenty minutes, followed by most marked results, the pulse improving in quality in a few minutes after each injection. A second period of extreme collapse following, it became evident that the trachea below the tube was filled up. Tube was removed. the patient held over the side of the bed with the head very low, and with a pair of long, narrow, curved forceps considerable solid mucus which could not be expelled through the tube was removed. After this there was improvement in breathing and final recovery.

The author regards the nitroglycerin, which was given in varying doses continuously for many days, as having been an important element in the recovery. Patient was discharged from the hospital 29 days after the operation.

Pathologist's report showed colloid struma, originating in thyroid tissue. A review of the published cases of similar nature follows, with an extensive bibliography.

Richards.

Subglottic Sarcoma Removed Endolaryngeally with Galvano-Cautery Snare.

J. W. GLEITSMANN, New York. (*Medical Record*, July

5, 1902.) The growth was in a man 52 years of age, whose only complaint was of a dry cough, some bloody expectoration, some dyspnea and a very hoarse voice of four months duration. The patient was extremely docile and easy to examine. Below the vocal cords, and having its point of fixation anteriorly, and at the beginning of the trachea, was a growth which filled the larger part of the tracheal space. Under the application of cocain and adrenalin (preparations for tracheotomy having been made), Dr. Gleitsmann was able by means of a Schech's handle and canula and iridoplatinum wire to throw the snare around and under the growth. The wire was tightened very slowly. The removal was effected at the first introduction of the wire snare, and the tumor brought through the glottis without difficulty. The basis was cauterized immediately afterward with a flat galvanocautery burner. Microscopic examination showed the growth to be of sarcomatous character, partly round-celled and partly myxosarcoma. *Richards.*

Tuberculosis of the Larynx and Pregnancy.

A. Kuttner. (*Archiv für Laryngologie*, Bd. 12.) For a long time we have known the baneful effect of pregnancy on tuberculosis of the lungs. In regard to the connection with laryngeal tuberculosis, no papers have been published. The author has undertaken the task of collecting material for the solution of this question from his own experience and from reports from other physicians. The author has collected 15 cases, 8 were primiparae, 7 multiparae. 3 plainly suffered from pulmonary tuberculosis. In the 12 others, there were no symptoms at the time of the beginning of pregnancy. In 2 patients, the tuberculosis was healed before the inception of pregnancy. Of the children, at the time of the conclusion of the investigation 3 were still living, the others died a few days or weeks after birth. All 15 mothers died a short time after birth of children, at the latest 56 days afterward, althrough the delivery progressed normally. The larynx showed in all cases a high degree of swelling in the superior part of the larynx, and later degeneration. A mortality of 100 per cent. causes the author to recommend an artificial abortion, without paying any attention to the child which usually dies anyhow, whenever any hope remains of saving the mother, at least in the earlier months of pregnancy. In this way it may be possible to save the mother in a few cases. *Levy.*

A Necrotic Bone Embedded Under the Glottis.

A. ONODI. (*Monatsschrift für Ohrenheilkunde*, 35 Vol.) A 32 year old man, infected with lues 8 years before; 3 years ago dyspnea in increasing degrees appeared, which disappeared under sublimate injections; 2 years ago he coughed out a small piece of bone; he came to the writer suffering with a sudden attack of suffocation. Laryngoscopically, a foreign body was found. This was removed by an incision in the larynx and was found to be a necrotic piece of bone. The dyspnea disappeared, but aphonia remained as a result of fixation of the vocal cords. The author explains the condition as follows. On the basis of the lues, there appeared a perichondritis of the cricoid cartilage which caused its ossification and later an extrusion of a piece of bone. The fixation of the cords could be explained in different ways, e. g. through changes on the point of the arytenoid cartilage or in loss of its attachment or muscles. *Levy.*

Bilateral, Total, Recurrent Paralysis.

PROF. MYGIND (*Archiv. für Laryng.*, Bd. 12) adds his personally observed case to the 16 previously known. A tubercular patient suffered with pain in swallowing and hoarseness. The examination showed a cadaveric position of the vocal cords. The esophageal sound met an obstruction in the superior portion of the esophagus. Post mortem, a carcinoma was found which involved both recurrents. Microscopically, an infiltration of the nerve sheathes with carcinoma cells was seen. The recurrents, as well as the muscles supplied by them, showed high degree of degeneration. The fact that the cricothyroideus, also, was degenerated would indicate that this muscle was at least partially supplied by the recurrent. *Levy.*

Tracheal Sarcoma.

PROF. KILLIAN. (*Archiv. für Laryng.*, Bd. 12.) A young lady, 25 years old, began to spit blood. He found, as the cause of this, a tumor of the left tracheal wall, about half way down, which narrowed its lumen to one-half and caused dypsnea. The author was able to use direct tracheoscopy, under cocain, by introducing a corresponding tube, 9 mm. wide and 20 cm. long. It was possible, after some effort, to remove a large piece of the tumor, which was found to be a large-celled sarcoma. On account of the evident benignity of the growth, the author resolved to remove the remainder by the same method. He used the cold snare, afterward cauterizing the base with the electric cautery. One and a half years later the patient had not had a recurrence. *Levy.*

Post-Operative Laryngeal Hemorrhage Checked by Solution of Gelatin.

B. GOLDSCHMIDT. (*Therap. Gegenwart*, 1902.) After the author had curetted the aryepiglottic folds of a phthisical patient, the resultant hemorrhage could not be checked by the ordinary means. By syringing some drops of gelatin solution on the wound, he was able to stop it at once.

Levy.

The Diagnosis of Laryngitis Circumscripta.

G. RICHTER. (*Monatschrift f. Ohrenheilk*, 36 Jahrgang, No. 2.) B. Frankel has described a form of laryngitis in influenza, characterized by white spots on the vocal cords. These spots, which are probably fibrinous infiltration, were observed once by Glatzel on the false cords, The author has seen only 4 cases. Three times the infiltration was on the false, once on the true, vocal cords. Influenza was not present in any of these cases. The incubation period was 2 to 3 days; the duration of the disease, 3 to 7. The symptoms consisted of chills and fever, sensation of sticking in the larynx, dyspnea when in recumbent position, coughing and a slight hoarseness. *Levy.*

Croupous Laryngitis, with Protracted Course.

SZONTAGH. (*Pester Med. Chir. Presse*, No. 30, 1902.) A child, 3 1/2 years of age, was taken with laryngeal croup, characterized by a broad membranous deposit. Twenty-five hundred units of antitoxin were injected, but the symptoms increased in severity, and intubation was necessary. Five thousand units were injected in the next two days. After the removal of the tube, suffocation immediately occurred, and rendered its replacement necessary. Ten days after the beginning of the illness the tube was again removed, and a small amount of croupous exudate coughed out. During the next two weeks, portions of membrane were continually coughed out, and suffocative attacks occurred, rendering intubation again necessary. The croupous process lasted for a period of 31 days, during 26 of which intubation was necessary.

Goodale.

Course of Laryngeal Tuberculosis in Pregnancy.

VEIS. (*Wiener Med. Blatter*, No. 20, 1902.) A woman, 23 years of age, had suffered from laryngeal tuberculosis for 2 years. After marriage and pregnancy, examination showed an increased tubercular infiltration. This increased and was followed, later, by dyspnea, so that it was considered desirable to induce labor. After the birth of the child, an improvement took place in the dyspnea, but the ulceration continued to progress, and death followed during the following month. The writer recommends an early induction of labor in early laryngeal tuberculosis, where the disease of the lungs is not too advanced. *Goodale.*

Case of Hereditary Localized Edema Proving Fatal by Laryngeal Obstruction.

GRIFFITH (*British Medical Journal*, June 14, 1902) gives an interesting description of a case of angio-neurotic edema in a female which was carefully watched for six years, during which she had many attacks. Her father was the subject of similar lesions, and died also from sudden laryngeal edema. Her death was sudden. Postmortem revealed extensive edema of the larynx, affecting not only the mucous membrane, but also the deeper conconnective tissue and the endomysium.

Wyatt Wingrave.

Observations on Intubation of the Larynx.

GOODSELL. (*Edinburgh Medical Journal*, March, 1902,) An analysis of 101 cases, 44 being followed by tracheotomy, and 7 in which it failed. Unsuccessful intubation were due to (1) inexperience; (2) glottic spasm; (3) glottic edema; (4) use of gag aggravating dyspnea.

Wyatt Wingrave.

V.—MISCELLANEOUS.

Paraffin Injections.

NEUMANN (*Prager Med. Wchsch.* No. 26, 1902) employed paraffin injections in a case of facial disfigurement following an operation upon a cyst of the antrum. 3 c. c. of paraffin at the melting point of 42° C. mixed with salicylate of soda (5 per cent.) were injected through the margin of the wound, into the cavity previously occupied by the cyst. A portion of the paraffin came away subsequently in small pieces, and a subsequent injection of 2 C. C. of paraffin was made. The wound subsequently closed, and the paraffin has remained in the cavity without reaction. *Goodale.*

Etiology of Diphtheria.

ZUPNIC. (*Prager Med. Wchnsch.*, No. 34, 1902.) 1. In a considerable number of cases of unquestionable Bretonneau's diphtheria, there are no Loeffler bacilli present. 2. Loeffler bacilli are frequently found in a large number of diseases in the mucous membrane of the respiratory organs, having nothing in common with Bretanneau's diphtheria. 3. Loeffler bacilli may remain for a long time in the mucous membranes of healthy persons, who have never had diphtheria previously. 4. The disease produced by the inoculation of Loeffler bacilli in animals is totally different from human diphtheria. 5. The name diphtheria bacillus includes a number of different varieties, whereas in a typical epidemic of Bretonneau's diphtheria a single exciting factor must be postulated. 6. In the same attack of diphtheria, two or three varieties of Loeffler bacillus may occur side by side. In cases affecting whole families different varieties of the Loeffler bacillus may occur in different members. 7. Cases have occurred of the Brettoneau diphtheria where in spite of a direct transmission of the infection, it was impossible to isolate the Loeffler bacilli. *Goodale.*

Bacteriologic Diagnosis of Diphtheria.

SALUS (*Prager Med. Wchnsch.*, No. 15, 1902) concludes that the diphtheria bacillus is essentially concerned in the production of diphtheria. We can diagnosticate diphtheria bacteriologically to-day better than ever before. We should diagnosticate in all doubtful cases by bacteriologic methods if only for prophylactic reasons. *Goodale.*

Bacteriologic Diagnosis of Diphtheria.

GANGHOFNER (*Prager Med. Wchnsch.*, No. 15, 1902) agrees with the views of Salus in regard to the relation of the diphtheria bacillus to diphtheria, and does not consider the conclusions of Zupnic justified. A most important argument in favor of the relationship between the organism and the disease consist in the therapeutic results achieved by the use of antitoxin. *Goodale.*

Treatment of Scrofulous Cervical Lymphnodes with Hot Douches.

UNTERBERGER (*St. Petersburger Med. Wchnsch.*, No. 32, 1902) describes a method of treatment of scrofulous cervical glands, by the local application of hot douches of salt water, as practiced in Biarritz. The salt water here comes from a salt spring, containing 23 to 25 per cent. of solids. The patient is placed in a cabinet provided with filiform douches, having a pressure of 7 meters' height. The temperature of the concentrated salt water is 40° C. The treatment is directed for one to three minutes against the affected glands, producing a marked reddening of the skin. After the douche the patient receives a warm bath, and is lightly dried with hot linen towels, but not rubbed down. As a result of this the body is covered with delicate white crystals of salt. The patient lies quietly now a quarter of an hour, and after his return to his room lies quietly for another half hour. After this the patient generally partakes of a meal, and then goes out of doors. As a rule, after the 8th or 10th douche the glands begin to enlarge, and then gradually diminish in size or entirely disappear, as a rule not more than 20 baths are prescribed. Frequently the glands begin to diminish only at the beginning of the ensuing winter. The most comfortable time for the treatment in Biarritz is September and October.

In connection with this local treatment, the patient is directed to add as much salt as possible to his food, and to spend as much time as possible in recreation, in places out of doors, where the ground is impregnated with salt. As a result of all these procedures, the osmotic pressure is increased throughout the whole body, which raises the alkalinity of the blood, and favors tissue metamorphosis.

The writer has employed this method of treatment in the hospital by directing hot douches upon the affected glands for a period of one to three minutes, and thereupon applying hot compresses of salt solution. The results have been very gratifying, and have also been favorable in subcutaneous infiltrations and diseases of the joints and bones. *Goodale.*

The Mechanism of the Circulation in the Vena Jugularis Interna.

MANN (*Zeitsch. f. Ohrenheilk.*, Bd. 40) could see, in a case of total absence of the drum, the bulbus jugularis visible on the floor of the middle-ear. It pulsated strongly. It emptied itself so completely that it almost disappeared from view. This took place almost immediately before the ventricular systole. The dilation was shown, corresponding to the systole. The pulsation is strongest when the head is turned so far to the right that the left mastoid process is just above the sterno clavicular articulation. He draws the following conclusions: (1) Most of the venous blood is carried off by the jugularis interna. (2) Blood movements in the interna are subject to the influence of the respiration. (3) By turning the head to the side, it is caused by the sucking action of the right ventricle. If it is desired to test whether the bulbus or the jugularis is thrombosed, the patient must hold his head in the corresponding position. *Levy.*

Tracheotomy and Intubation as Operations in Diphtheritic Stenosis.

KAHN (*Jahrbuch f. Kinderheilkunde*, 55 Bd) contrasts the indications for tracheotomy and intubation, basing his statements on the results found in the Leipsig Children Clinic. Primary tracheotomy is indicated (1) in rachitic children under one and a half years; (2) in collapse; (3) in septic, gangrenous pharyngeal diphtheria; (4) in pharyngeal diphtheria; (5) in mechanical obstruction in the larynx itself; (6) in edema or emphysema of the throat; (7) if a bronchial stenosis complicates case; (8) in dyspnea even after intubation has been performed. Secondary tracheotomy is indicated (1) when a continuous dyspnea follows the withdrawal of a tube which has laid in position several days; (2) when the tube is stopped by a membrane, or there is danger of it becoming so; (3) when perilaryngeal abscesses appear; (4) when it is impossible to make the child leave the tube in position; (5) when there is difficulty in feeding. In private practice, intubation is to be used only with great care.

Levy.

Tortuosity of the Internal Carotids.

MOORHEAD. (*British Medical Journal*, Feb. 8, 1902.) His experience as demonstrator of anatomy led him to consider it very common, and that it was generally bilateral, occurring in old age and due to arterio-sclerotic changes. *Wyatt Wingrave.*

Intratracheal Injections in Phthisis. Use of Glycerin as a Vehicle and its Advantage Over Oils.

COLIN CAMPBELL, and others. (*British Medical Journal* Feb. 22, 1902.) British Congress on Tuberculosis. Glycerin mixes more freely with the secretions than does oil. It causes an increased flow of pulmonary (sic) secretion. As much as three ounces may be injected at one sitting. Influenced by Delepine and Coutts' experiments which proved that a solution of 1 in 125 would kill tubercle bacilli in sputum in one hour, he injected this solution intratracheally with excellent results.

Formula of solutions:

Medicinal Izal	ʒiij
Menthol	ʒij
Glycerin	ʒiv

Wyatt Wingrave.

Esophagotomy for a Foreign Body.

M. C. CRINDLE. (*British Medical Journal*, May 31, 1902.) Boy, aged 16, swallowed a tie clip, which was located in the esophagus by x-ray about one inch above the level of sternum. It was removed by esophagotomy. Drainage tube left in wound was removed on 11th day. Fed per rectum till 11th day, entirely by mouth on 15th day. *Wyatt Wingrave.*

Electric Light in Diseases of the Respiratory Organs.

W. FREUDENTHAL, New York (*N. Y. Medical Journal*, July 12, 1902), presents a valuable contribution to the literature of electrotherapy, which should be read in full.

The author first discusses the physiologic effects of electric light and quotes experiments of Bergel to show that molecular activity is set into activity by the action of light and ceases in complete darkness. Blue and violet rays are bactericidal, but do not penetrate beneath the cutis. Red rays can enter the lungs. The growth of the bacillus of typhoid is hindered by direct sunlight. The electric ligh increases powerfully the metabolism of the skin, and so assists action of the kidneys and lungs. While the incandescent light has been used therapeutically, the author prefers now the arc light. This he uses in the form of the ordinary searchlight. The sittings are daily, for a space of 30 minutes. The strong heat produced can be relieved by a glass screen. This, however, absorbs, in part, the ultra-violet rays; so, frequent turning of the chair, with application of ice-cloths, is preferred. The author has used it since 1889 in tuberculosis of the larynx and lungs. He does not claim that it cures advanced cases, but that it is a valuable adjunct to our other remedies in relieving dysphagia and pain in the chest. In beginning cases, he believes he has effected several cures. He quotes at length the histories of several cases where good results have been secured. *Harris.*

Anesthetizing of the Mucous Membranes with 25 Per Cent. Alcoholic Cocain Solution.

W. Wroblewski (*Archiv. für Laryng.*, Bd. 12) highly recommends the use of a 25 per cent. alcoholic cocain solution in operations on the nose, throat and larynx. In many cases the patient did not have even the sense of touch. *Levy.*

The Nerve Element in Diseases of the Nose and Throat.

W. G. B. Harland, Philadelphia. (*Philadelphia Medical Journal*, Aug. 23, 1902.) A plea for the careful study by the specialist of the general as well as the local conditions in those cases coming under his attention, on account of the intimate relationship which exists between the ear, nose and throat and the general nervous system. In the cases reported, showing the complex relationship between the nose, the eyes and the uterus, treatment of all three was required before a cure was effected. *Richards.*

A Discussion of the Morbid Conditions of the Upper Respiratory Tract Resulting from the Infectious Diseases.

C. M. Cobb, Boston. (*Philadelphia Medical Journal*, May 24, 1902). The author regards a large number of the cases of sinus trouble and of chronic catarrhal discharge in the nose and throat as being due to the ultimate results of the infectious diseases. Out of 102 cases which complained of nasal or postnasal discharge, without nasal obstruction, he found that 25 followed attacks of influenza; 14, diphtheria; 7, scarlet fever; 6, measles; 4, typhoid fever; and 2, pneumonia. He does not believe in treatment during the height of the primary disease, and thinks there is danger in the use of sprays and douches, as these are almost certain to carry the disease further than it would have gone if left alone. One of the most serious consequences of treatment by douches and sprays is the involvement of the middle ear. The Klebs-Löffler bacilli persist a long time in the nose and may be a source of menace to the public. *Richards.*

Report of Five Cases of Asthma Treated with Silver Nitrate Injections.

H. T. BASS, Tarboro, N. C. (*Philadelphia Medical Journal*, June 21, 1902.) These cases of asthma were treated by the hypodermic injection of five drops of a two and a half per cent. solution of silver nitrate, placed under the skin over the vagus nerve, a little to the side of the carotid artery, about midway between the angle of the jaw and the clavicle, in accordance with the method of Dr. Mays. Injections were given every eight days. Two cases seem to have been permanently relieved, while the other three were relieved somewhat while under active treatment. In three of the cases abscesses formed at the point of injection. (Further experience with this agent would seem to be necessary before it can be very enthusiastically recommended). *Richards.*

Recent Advances in Laryngology.

CHARLES H. KNIGHT, New York . (*Therapeutic Monthly*, June, 1902.) The author's experiences with metallic intranasal supports for the corretion of external nasal deformities have been unsatisfactory. He thinks the new method of paraffin injections has met with generally favorable results. Certain precautions are observed. There must be a perfectly aseptic mixture of the paraffin and cocoa butter, the melting point of which should be between 97 and 104° F., as there is danger of fat embolus if it is too fluid. The mixture must be carefully sterlized, and attention to antiseptic details insured; as some instances of violent local reaction and three of actual suppuration have occurred. "The injected material is said to become encapsulated and to some extent traversed by fibers of connective tissue. The amount used is proportioned to the degree of deformity."

"There seems to be no limit to the possibilities of paraffin injections and no objection to their employment except such as may be attendant upon avoidable carelessness in technique."

Richards Lake has used this method for enlarging the turbinated bodies that had undergone absorption in a case of atrophic rhinitis. "Five minim injections of paraffin at weekly intervals led to remarkable improvement in the local appearances and the subjective symptoms."

While admitting that adenoids can be removed from a conscious child, providing one's assistants are sufficiently muscular, the author regards such an operation as not only brutal, but impossible to be as thoroughly done in a struggling patient as it ought to be. For an anesthetic, he regards chloroform as especially dangerous in children with lymphatism, and thinks the combination of nitrous oxid gas and ether leaves nothing to be desired as regards comfort, celerity and safety. While ethyl bromid is growing in favor, experience with it is still too limited to justify a final opinion.

But little progress has been made in the treatment of malignant disease of the larynx; and, in spite of the occasional successful radical extirpations, he thinks the majority of patients would decline to submit to the mutilation involved in complete laryngectomy. Unless something is developed from X-ray therapy, we have only to contemplate an existence prolonged by a tracheotomy and alleviated by the use of anodynes.

In the case of laryngeal tuberculosis, radical surgical measures should be reserved for cases of superficial or circumscribed laryngeal disease in those affected with a limited or quiescent pulmonary lesion, and for those rare cases of primary laryngeal disease in which complete eradication seems feasible. In some cases ethereal solutions of iodoform are soothing; in others inhalations of menthol act well; orthoform seems to be the most satisfactory sedative thus far offered. *Richards.*

BOOK NOTICES.

Klinische Vorträge aus des Gebiete der Otologie und Pharyngo-Rhinologie.

Herausgeben von Prof. Dr. Haus-Münchenn.
Fünfter Band. Fünfter Heft. Die Ozena.
" " Sechtes " Das Heufieber.
" " Siebentes " Ohr und Sprache.
" " Achtes " Functionsprüfung des Ohres.

The publishing house of Gustav Fischer in Jena continues this series of clinical lectures (see review in the February, 1902, Annals of Otology for preceding numbers), and in this way opportunity is given to present monographs on special subjects of oto-laryngology with a freshness that can hardly be found in a volume or text-book covering the whole field. Each monograph is, of course, written by one man, who, after reviewing the recent literature of his topic, adds his own opinion and experience and makes his own personal standpoint the one from which he finally examines the matter.

The *fifth volume, fifth number*, pages 297 to 338, treats of *ozena*. Wilhelm Grosskopff, of Osnabruck, is the author, and he cites 234 references since 1896, before which he refers to the exhaustive literature index to be found in Hegemann's Handbuch. Many of these references are from French, English and American sources, and it is a pleasure to note how thoroughly he has scanned our own literature for them.

He uses the usual subdivisions of symptoms, objective and subjective, Diagnosis, Prognosis, Etiology, Pathologic Anatomy and Treatment. Perhaps the examination of the various theories for the causation of ozena is as interesting as any of his chapters, for he finds six well established causes as given, and ranks his authors under their various banners. Treatment is, of course, what we like to see, and hence we have sixteen pages of it—unusually exhaustive for a German. Cleanliness is the essential (by douches, by tamponade); then he subdivides under eight heads the remaining procedures. 1. Surgical. 2. Massage. 3. Electricity. 4. Serumtherapy. 5. Anterior tamponade. 6. Local drug treatment. 7. Combined methods. 8. General bodily care.

Grosskopff is an advocate of no particular theory or school, though he likes tamponade and seems to have been encouraged by the use of phenol, natr. sulforicin. in 30 per cent. solution mixed with equal parts of water.

It is a well arranged study of this discouraging subject. The price of this number is 1 mark. 20 pf.

Fifth volume, sixth number, pages 341 to 400, is by Dr. Emanuel Fink (Hamburg), on *Hay Fever and Other Forms of Nervous*

Catarrh. He has a long history of the disease and an equal long analysis of the symptoms. His treatment occupies fourteen pages, part of which, however, discusses various methods only to discard them. The gist of his thesis is found italicised thus: "I think I have discovered a drug thoroughly trustworthy for all forms of nervous coryza: its use seems based on rational theory, and to have proved itself of value in practice in all uncomplicated cases." This miracle working drug is *aristol* and it must be applied to the mucous membrane of the antrum of Highmore. The author then gives his method, and describes fourteen cases in which he effected a cure by this means.

There are 93 citations from recent literature. It becomes finally such special pleading that some of the value as a completed lecture is lost. (Cost 1 mark, 50 pf.)

Fifth volume, seventh number, deals with the acoustic test by means of speech. Treitel, of Berlin, takes from pages 403 to 417 to analyze the use of the vowels and consonants of the human voice in testing the ear's perception. He does not agree with Wolf and explains why the latter's tables are misleading. Much stress is laid on the statement that the vowels are equally grasped by the patient to form the complete word by guess. Word hearing is not the same as tone hearing. He does not theorize, but brings many facts to show the difficulty of constant scale of spoken sounds. Much of the utility of the essay is lost for foreigners, because the sounds as represented by the printed symbol differ in languages, and exact translation should be supplied before its English application should be attempted.

Fifth volume, eighth number, pages 421 to 447, is by Zimmermann, in Dresden, and deals with the *Purpose and Methods of Testing the Ear's Function.* This essay is intentionally placed immediately after that dealing with speech as test of the function of the ear, as Zimmermann has much to say about the method of oral and whistle tests. He commends the watch and the piano as being practical and places a conservative but unprejudiced estimate on tuning forks. Mehle's, Schwabach's, Gelle's and Rinne's tests are all explained (though not in detail) as completing the findings by the simple and more exact methods. A. B. Hale.

Die Berufskheiten des Ohres und der Oberen Luftwege.

von Dr. med. Friedrich Röpke in Solingen. Wiesbaden, J. F. Bergman, 1902. 5 Marks.

(This is the second number of the series on Aural Therapeutics edited by Dr. Körner.)

This work by Röpke is very comprehensive, envincing an enormous amount of patient labor by the author. The motif of the work, as the title implies, is an inquiry into the influences of occupation as causing diseases of the ear and upper air passages.

We are all aware that various occupations have characteristic pathologic effects upon the human organism, e. g., workers in lead contact lead poisoning: workers in phosphorus get necroses: and wool sorters are affected with anthrax; but Röpke's work awakens us to a realization of the very general dependence of ear, nose and throat diseases upon occupations.

In studying the relations of occupations to disease, Dr. Röpke has taken the pains to get an intimate personal acquaintance with the details of processes and manipulations in the great number of trades and occupations. His descriptions of these matters render his work incidentally of general interest aside from its main professional purpose.

The scope of the work may best be illustrated by inserting here an abridgement of the table of contents. The diversity of the trades and occupations considered will thus be be clearly shown:—

A. The Occupation Diseases of the Ear and Upper Air Passages among Industrial Laborers and Trade Workers.

I. Mining.
II. Chemicals.
III. Metallic Industry.
IV. Stones and Earths.
V. Building Pursuits.
VI. Wood Working and Allied Pursuits.
VII. Polygraphic Pursuits.
VIII. Dye Stuffs.
IX. Explosive Substances and Inflammable Goods.
X. Fertilizer Factories, Tanneries, Glue Factories.
XI. Oils, Fats, Varnishes and Resins.
XII. Heating and Lighting Materials and Their By-Products.
XIII. Textiles.
XIV. Paper.
XV. Clothing and Cleansing.
XVI. Provisions and Delicacies.
B. Among Agricultural Laborers.
C. Among Soldiers.
D. Among Employees in Public Traffic.
E. Among Sportsmen.
F. Among Those Belonging to Various Vocations.

The subdivisions are numerous. It would seem as if scarcely a trade or occupation had passed unnoticed in relation to its effect upon the ear and upper air passages. From coal-miners up to balloonists and then down to pearl divers are far reaches; from football players, boxers and wrestlers to nuns and musicians is a decided change; yet all these occupations are considered, and serve here to illustrate the inclusiveness of the work.

The work is of value for reference and as an illustration of a painstaking, scientific method of research. Röpke's plan might well be used generally in determining the relation of occupation to other organs and functions of the body.

For ready diagnostic aid, this book is not especially adapted. It can, however, be made of use in this respect if one realizes the importance—which the work tacitly emphasizes—of accurate detailed histories of cases. In diseases of uncertain etiology, by references to Röpke's book, unexpected causal relationship may often be found between the patient's occupation and his pathologic condition. Thus also the line of treatment may be rendered clear as consisting either in a change of occupation or in the use of greater precaution in its exercise.

To the book is appended:— "A Scientific Summary of the Occupation Diseases of the Ear and of the Upper Air Passages arranged alphabetically according to the particular kinds of occupation with reference to the seat of nature of the disease."

By reference to this table one may discover readily in the case of a particular pathologic condition of the ear or upper air passages just what occupations are liable to the affection. Occasionally, also, the special cause of the affection designated in parenthesis. For example, in the case of eczema of the lobe of the ear we find that among others who incur the affections are:

Chimney Sweepers (Soot) 136.
Rope Makers (Tar) 95.
Swedish-Watch Factory Workers (Paraffin) 81.

The numbers refer to the page of the book upon which a detailed account of the subject may be found.

A similar table would be valuable arranged with the occupations as headings, and stating briefly the diseases to which each occupation is liable. Such a table, would be of course, merely a recapitulation of the subject matter of the book, but in its tabulated from it would be of value for ready reference.

The bibliography of the book is compendious. Commendation of Röpke's work is somewhat superrogatory. It speaks for itself. The thoroughness which is as characteristic of articles written as of articles made in Germany is exemplified in this book.

J. H. LINDSEY, M. D.,
Fall River, Mass.

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